



JPRS Report

Environmental Issues

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Environmental Issues

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**Canadian Minister Welcomes Japanese Support
Against Over Fishing**

*OW1701115192 Tokyo KYODO in English 1048 GMT
17 Jan 92*

[Text] Tokyo, January 17 (KYODO)—Canadian Fisheries and Oceans Minister John Crosbie said here Friday he is pleased with the Japanese response to his calls for ending overfishing in the northwest Atlantic.

Crosbie, who met with Masami Tanabu, Japanese minister of agriculture, forestry and fisheries, and officials of Japanese fishing companies, said the Japanese, who had remained neutral in the long-standing Canada-European Community (EC) dispute on overfishing, are now "coming on Canada's side."

"The Japanese are high seas fishermen and had been wary of our efforts, but I am now convinced they are supporting Canada's position."

Crosbie, who also took his message against EC overfishing, particularly by Spain and Portugal, to London earlier in his trip, said the British also seem more supportive than they have been.

"Response has been good (from Japan and Britain), but the South Koreans have simply stonewalled. We have sent them diplomatic notes about their overfishing, but they just ignore them. Spain and Portugal make wonderful speeches, but they simply ignore them and continue to overfish," he said in Tokyo.

Crosbie did not visit Seoul this trip, but said he would be pressing South Korea to begin conserving fish stocks in the Atlantic.

With Japan and Britain coming on board, Crosbie said he is now more confident that a special meeting of the Northwest Atlantic Fisheries Organization (NAFO), which is charged with managing fish stocks in the high seas off Canada's grand banks, will be held in April or May to tackle the growing problem of depleted cod, flounder, and redfish stocks.

Japan, he said, has become more interested in the issue because Japanese fishing quotas inside Canada's eastern seaboard 200 mile economic zone have been cut by 10,000 tons annually because overfishing by the EC fleets and others, such as from South Korea, have depleted stock inside Canada's exclusive economic fishing zone.

"Japan has also been very careful to meet all international standards on fishing outside the economic zone and has abided by all such laws. Even though their long-distance fishing fleets are only a sixth now of what they once were, they understand the issue and their strong moral position should help us at a NAFO special meeting."

Crosbie added that he will take his campaign against overfishing to the United Nations Conference on Environment and Development, known as the "Earth Summit" in Rio de Janeiro in June.

"I can't see how any objective observer could fail to be shocked by the arrogant behavior (of the EC) in this matter."

"It is difficult to get international publicity on overfishing—you don't see any famous actresses running over to kiss and cuddle a codfish—but I can't see how this major international conference (the Earth Summit) can not be prepared to deal with this terrible threat to the whole world's fisheries resources."

Crosbie, who also officiated at a seminar in Tokyo on underused species such as surf clams, squid, redfish, and other fish and shellfish not popular among Canadian consumers, said Canada will mount a joint industry-government campaign to market those species in Japan, where Canada sold more than half a billion dollars worth of marine products last year.

The campaign is estimated to cost 1.5 million Canadian dollars over two years and will target Japanese consumers.

**EC, Japan Identify Areas of Potential
Environmental Cooperation**

*OW1701115492 Tokyo KYODO in English 1124 GMT
17 Jan 92*

[Text] Tokyo, January 17 (KYODO)—Japan and the European Community (EC) concluded a high-level meeting on the environment here Friday, identifying a number of areas of potential cooperation.

A joint press statement released after the two-day talks said that officials from Japan and the EC, meeting on the environment for the first time at such a high level, committed themselves to cooperate on such issues as tropical forest conservation, acid rain, and global warming.

The statement said the two sides also agreed to exchange information on such issues as waste management, classification of dangerous chemicals, and the use of economic instruments in protecting the environment.

Environmental cooperation was identified in the Japan-EC Joint Declaration, issued last July in The Hague, as one of the areas where bilateral cooperation should be strengthened.

Deputy Foreign Minister Koichiro Matsuura headed the Japanese delegation, while his EC counterpart was Laurens Jan Brinkhorst, a former ambassador to Japan who now serves as Director General for the Environment, Nuclear Safety, and Civil Protection.

Foreign Ministry officials said the EC side supported the Japanese side's statement that countries should make a strong appeal to the United States to implement more stringent measures to limit carbon dioxide (CO₂) emissions at the 1990 level to help rectify the global warming problem.

Officials said that on the issue of global warming, the two sides agreed to hold a workshop of experts on methane and NO₂ [as received], the major greenhouse gases besides CO₂ and those about which relatively less research has been done.

Officials said another measure related to global warming was the two sides' agreement to directly exchange information between their respective institutions involved in research on regional models for environment-related scientific analysis.

The EC side was said to have responded positively to a Japanese request for its financial cooperation in an International Tropical Timber Organization (ITTO) forest conservation project in the Malaysian state of Sarawak, which is being partially funded by Japan.

Officials said the EC side welcomed the visit of Japanese experts on acid rain to its institute on the environment. The officials said that the EC has more expertise in that field than Japan.

Officials said there was also an exchange of opinions on the idea of certain countries about introducing a new tax that would create revenue for conservation efforts.

The two sides agreed that similar high-level meetings on environmental cooperation should take place annually.

Island Nations Seek Insurance System Against Rising Sea Levels

OW1801044492 Tokyo KYODO in English 0332 GMT 18 Jan 92

[Text] Tokyo, 18 Jan (KYODO)—Island and low-lying countries have called for establishing an insurance system to save them from possible rises in sea levels caused by gradual global warming, government officials said Saturday.

The Alliance of Small Island States (AOSIS), consisting of 34 countries in the Southern Pacific such as Kiribati and Vanuatu, have made the request in negotiations on an international treaty on preventive measures for global warming. Under the AOSIS proposal, industrial countries would donate funds for the insurance in accordance with their gross national products and emissions of carbon dioxide for 10 years after the treaty takes effect. The countries affected by sea level rises stemming from global warming would be given insurance money under the system.

Scientists estimate that global warming could raise sea levels up to 60 centimeters by the end of 21st century. The proposal will be discussed in the sixth round of negotiations starting February 18 in New York, the officials said.

ANGOLA

First Phase of Tombwa Antidesertification Project Assessed

92WN0187A Luanda JORNAL DE ANGOLA
in Portuguese 5 Nov 91 p 2

[Article by Silva Lopes]

[Text] A mission that included representatives from the government, the FAO [UN Food and Agriculture Organization] and the UNDP [United Nations Development Program] has been in the province of Namibe, where, from 20 to 28 of the current month, it carried out a reformulation of the first phase of the antidesertification project in Tombwa.

The national director of the Institute of Forest Development, Paulo Vicente, told ANGOP [Angolan Press Agency] that the mission accomplished the reformulation, the first phase of which began in 1989 with financing from the UNDP with \$1.2 million, and which is projected to end in the coming month of December.

During the course of these sessions, whose goal it was to put into perspective the actions aimed at creating conditions favorable to the start-up of the second phase, Paulo Vicente said that gaps were discovered with regard to the lack of appropriate techniques of irrigation, motorized pumps, and the inadequacy of means of transportation, among other problems that were making the normal operation of the work more difficult.

The first reformulation of that project, whose first document was approved in 1987 by government authorities and the UNDP, was carried out in December of last year.

Paulo Vicente stated that even as far back as that time, numerous inadequacies had already been detected that were the cause of the impasses that were commonplace surrounding the project. The goal of this project is to defend the municipality of Tombwa against the steady advances of the sands of the Kalahari desert which are threatening it, just as has already occurred at the commune of Baia dos Tigres, which is almost buried.

For Paulo Vicente, who headed the above-mentioned mission which was composed of experts from the FAO and the UNDP, among whom were Engineer Mohamed Ha-Jej and Doctor Amadou Moctar, respectively, the first mission that analyzed the initial phase of the project succeeded in pushing it onward toward subsequent actions.

On that occasion, the mission made an in-depth evaluation of the results of applying the techniques of biological fixation (the planting of small trees) around that municipal city which has 24,000 inhabitants.

The trees, which are adaptable to the climate, are causarinas, which are of national origin, and others for which seeds will be imported.

As a result of the completion of the first phase of the project, nearly 400 hectares of terrain have already been prepared through fixation of the above-mentioned fences that serve to prevent the destruction of the 40 small trees planted per hectare (400 small trees) by the sands.

In addition to the desertification plans in themselves, the board of directors of the project is undertaking actions with the creation of a nursery and drilling in the area of the Curoca River (Pinda) where a project is likewise being developed with the goal of planting an area with trees to serve as a future source of natural fuel for the local people. According to what Paulo Vicente revealed, the government's share is valued at 73 million new kwanzas that have been invested in the acquisition of other related resources.

When asked to comment on the projects of national scope of the organization that he directs, Paulo Vicente said that the national institute has wide-ranging projects whose aim it is to revitalize the six national reserve parks that the country owns.

To bring the projects to fruition, the institute already has proposals from various international institutions that have shown an interest in financing these undertakings.

The aim of these projects is to reestablish the forest guards, as well as to reinstate agents who will "hunt" poachers who target species such as black palancas, zebras, giraffes, ostriches, and other species.

Environmental Protection Department for Oil Exploration Created

MB3012184191 Luanda Radio Nacional Network
in Portuguese 1200 GMT 30 Dec 91

[Text] Angolan Petroleum Minister Joao Lamboite said in Soyo recently that his ministry has already created a department for environmental protection with a view to dealing with ecological problems caused by oil exploration. Lamboite added that there is a project for the resolution of environmental problems, the first phase of which is near completion.

Asked to comment on the planned oil exploration in deep waters, that official assured us that safety measures would be introduced, and that government has already adopted a program. He also noted that studies are underway and the results are satisfactory.

Government Officials Reportedly Poach Elephants

MB0501073792 (Clandestine) Voice of Resistance of the Black Cockerel in Portuguese to Southern and Central Africa 0500 GMT 4 Jan 92

[Text] The JORNAL DE ANGOLA reports that 80 elephants were killed in the past five months in Licuar National Park, Huila Province. The newspaper says that the elephants were killed by poachers.

Meanwhile, the Voice of the Resistance of the Black Cockerel has learned that Ministry of State Security operatives and Angolan government officials are involved in the poaching of elephants. One such official is Pedro Mutinde, the Popular Movement for the Liberation of Angola-Labor Party governor for Cunene Province. Those officials, whose knowledge of ecological matters is very little or next to nothing, use land mines and antiaircraft guns to poach elephants.

BOTSWANA

Botswana's Need for Industrial Waste Management Stressed*92WN0223A Gaborone BOTSWANA DAILY NEWS in English 29 Oct 91 p 4*

[Article by Dan Peke]

[Text] The current system of waste disposal leaves much to be desired and because the human population, today far much exceeds that of the past, there is too much waste being produced and a lot of it is not easily degradable, says Mr. Eagilwe Segosebe of the Department of Environmental Science at the University of Botswana (UB).

Addressing the Kahlari Conservation Society, which hosted a talk on: "The Need for Industrial Waste Management in Botswana" at Maru-a-Pula Audio-Visual Centre on Wednesday, Mr. Segosebe, focusing on the need to clean up the environment, said the most common type of waste was organic and therefore biodegradable and it posed no environmental problem as much.

Mr. Segosebe said while it is notable that the country is economically expanding, it is also worth noticing that the ability to control our waste management is low and that it is annoying that places that do not produce any significant waste, are also affected when wind, water and any other means of natural transport carry the waste over.

He said he and a colleague at the UB interviewed 187 companies in Lobatse, Gaborone and Francistown, which produced potentially hazardous waste material.

They found out that companies that produced metal and metal products and those that produced chemicals and chemical products were the worst polluters.

He said: "Surprisingly, only 12 percent of the 187 companies admitted to producing hazardous waste and about 31 percent disposed of their own waste."

Mr. Segosebe said the legislation dealing with waste management is to blame because it does not require companies to say how they will dispose of their waste before they start operating, and as a result, 54 percent of the companies rely on councils to manage their waste.

"Essentially this means that councils merely allow companies to dump in official dump sites without categorising their types of waste into hazardous and nonhazardous."

He said that, as a result, the ground water which turns up in boreholes for human and livestock consumption, ends up contaminated with poisonous materials, leading to diseases.

Mr. Segosebe said Botswana should adopt the system used in Brazil, which requires every company to advertise its waste, in case somebody may have use of it to produce secondary products.

GHANA

Drought, Desertification Monitoring System Instituted*92WN0224A Accra PEOPLE'S DAILY GRAPHIC in English 19 Nov 91 p 1*

[Article by Abdul Aziz, Navrongo]

[Text] The Environmental Protection Council (EPC) and the United Nations Sudano-Sahelian Office, are evolving a mechanism to monitor symptoms and factors leading to environmental degradation in the Upper East Region for control of desertification in the country.

The region has been selected as the field office and monitoring assistants would be trained in the technique of detecting the symptoms.

Upon the submission of reports by the monitoring assistants, control activity will be embarked upon nationwide to reverse the negative trend.

Mr. Sulemann Osman Saaka, Regional Programme Officer of EPC, announced this at a one-week residential workshop for 50 selected monitoring assistants in the region at Navrongo.

He said the monitoring assistants will be engaged in contrast assessment, marking out and monitoring of the impact of the drought and desertification for action to be taken.

He said since it is a rural-oriented programme, emphasis would be placed on the involvement at the grassroots in the implementation.

He said the aim of the workshop would also include reviewing action to combat the effect of drought and the desertification and to develop new plans and strategies.

Mr. Godfred Abulu, Deputy Regional Secretary for Agriculture, who opened the workshop said the government appreciates the challenges of the environmental degradation in the country since it constitutes the main cause for loss of productive land and attendant food insecurity.

He, therefore, urged the participants to involve women who are permanently faced with the problems of the environment in their educational programmes.

Pollution Control Studied at Obuasi Gold Plant*92WN0224B Accra PEOPLE'S DAILY GRAPHIC in English 26 Nov 91 p 1*

[Article by Joe Isaac Haizel]

[Text] The Environmental Protection Council (EPC) is undertaking joint studies with the Ashanti Goldfields Corporation (AGC), to find suitable means of decreasing arsenic and sulphur dioxide emitted by the gold processing plant at Obuasi into the environment.

In pursuance of this, the AGC has been advised on the proper pollution control devices in the plant to trap most of the pollutants in the flue dust prior to discharge into the atmosphere.

Mr. J.K. Danso, Programme officer of the EPC, responsible for air and industrial pollution, said the installation of the control devices will improve the ambient air (external atmosphere) quality in the Obuasi area and decrease the devastating effects of the pollutants on the vegetation and landscape in the immediate vicinity of the mines.

Speaking to the GRAPHIC in an interview in Accra yesterday, Mr. Danso further noted that as a result of efforts to eliminate the use of firewood to heat the smelters and minimise deforestation, the studies have enabled the AGC to convert two out of its six roasters as at last year.

The six roasters make up the smelters in the AGC plant.

Mr. Danso explained that the AGC is expected to convert two other roasters this year and tackle the remaining two by the end of 1992.

In answer to a question about the current pollution situation at Ghana Cement Works (GHACEM) at Tema, Mr. Danso said it is expected that by the end of March, next year, dust extractors would have been installed at all the necessary points and a shed constructed so that the tipping of clinker into the storage silos would be done in an enclosed chamber.

He explained that three years ago, pollution studies done at the factory showed high levels of pollution about three times the recommended World Health Organisation (WHO) dust standard in the ambient air.

The EPC programme officer said the WHO standard is 250 microgramme dust per cubic metre of air.

On the possibility of workers of surrounding companies such as the Tema Shipyard and Drydock and AFKO calling for payment of cement dust allowance as is done to GHACEM workers, he conceded that though it seems reasonable there is no law to back the demand since they were not directly engaged in cement production.

MAURITIUS

Report on State of Environment Issued

92WN0220A Port Louis LE MAURICIEN in French
4 Dec 91 p 5

[Unattributed article: "State of the Environment in Mauritius: Putting the Environment at the Top of the Nation's Concerns"; quotation marks as published; passages within slantlines published in English]

[Text] Making the environment one of the main areas of interest at the level of both political thinking and / decisionmaking./ This is the goal set by the Minister of the Environment and Quality of Life, Professor Swalley Kassenally, using a national environmental policy.

The issue of the environment, he states in the introduction to /State of the Environment in Mauritius,/ increasingly occupies an important spot on the political agenda of several governments. Raising public awareness in this area has led to the environment's being put front and center in the concerns of decisionmakers in governments, industries, and households.

In recent years, he continues, the public's interest in the environment has taken on a sufficiently major proportion to force a change in political discourse in Mauritius. However the minister believes that efforts should still be made so as to ensure that this interest will be great enough to help the government and industry alter /the kind of decisions that industry have always made—or avoided making./

Tax policy as well as tax incentives in the areas of energy, agriculture, and forestry have not yet changed significantly. This has meant that the /stock of ecological capital/ continues to be depleted.

Besides, from the government's point of view, Professor Kassenally points out, problems relating to the environment arise owing to the absence at all levels in society—whether it be at the individual level or the level of businesses or decision-makers—of decision-making which takes the environment into account. This shortcoming is not necessarily voluntary, the minister continues, emphasizing that the public in recent years has demonstrated a great deal of interest in issues related to the environment. In his opinion, /the challenge is [to] integrate environmental considerations into decision-making in a more systematic, focused, and coordinated way. Therefore, the government's first priority is to help change the way decisions are made at all levels of our society which affect the environment./

The minister observes that in the past, choices were made without sufficient knowledge and an understanding of the way in which economic development affected the environment. This is why the government believes consolidating the base at the decisionmaking level is a priority. This consolidation, he believes, should occur through a new approach with regard to technology transfer, education and the dissemination of information, and via a judicious use of regulations and economic incentives.

"We can no longer afford to adopt a 'react and cure approach' when it comes to treating environmental problems." /Problems that are becoming more complex and pervasive and more difficult and expensive to clean up after the fact. Nor can we any longer afford to ignore environmental considerations in properly assessing our economic performance. Environmental degradation and mismanagement of our environmental resources impose social and economic costs./

The minister did not forget to emphasize that countries pay a price for the success of environmental protection policies. /People are likely to see the costs of environmental protection reflected in higher prices. But these costs will be offset by improvements in the quality of our air, water, and, ultimately, in human health./

The minister continues: /Moreover, new economic opportunities will be provided by a growing environmental industry sector—opportunities that Mauritius must explore, given the challenges of an increasingly integrated and more competitive world economy, and also as a leader in the field of environmental management among the African nations. The government believes that, in the final analysis, the economy will experience net gains as a result of integrating environmental consideration into decisionmaking./

Regarding environmental protection legislation, Prof. Kasensally believes that there exist two different approaches, i.e., a positive approach, which essentially includes measures involving bans and oversight, and a punitive approach, which advocates the imposition of legal sanctions. These sanctions, he stated, should be severe enough /to have a deterrent effect on the target industry./

The report is divided into three sections arranged as follows: (a) resources of Mauritius; (b) environmental issues; and (c) policy, institutions, and challenges.

Each section contains several chapters. Thus the first section studies nine different subjects, i.e., (1) land use, land resources, planning, and development; (2) the habitat; (3) people, development, and the environment; (4) water and the environment; (5) marine resources; (6) coastal zone management; (7) forest resources; (8) biodiversity and wildlife; and (9) Rodrigues.

The second section, devoted to environmental problems, touches on eight different subjects, notably: (1) the use of agrochemical products in Mauritius; (2) the sanitation environment; (3) solid-waste management; (4) the everything-down-the-drain approach and sanitation; (5) ecotourism; (6) road transport and the environment; (7) industrial development and technology; and (8) worker safety, health, and the environment.

The final section reviews the institutional structures in place to protect the environment, education on the environment, international cooperation in the field of environmental protection, and the main challenges in the area of the environment.

The entire report is supplemented with maps, diagrams, and photographs.

SEYCHELLES

Seminar Views National Oil Spill Contingency Plan

92WN0225A Victoria SEYCHELLES NATION
in English 21 Nov 91 pp 1, 2

[Excerpt] The potential threat to the country's socioeconomic development from oil spills has increased significantly in the past four decades, the Maison du Peuple seminar on the danger heard yesterday.

Mr. Maurice Loustau-Lalanne, principal secretary in the Ministry of Tourism and Transport, said at the inauguration of the seminar that secure methods of exploitation and transportation of oil, that would eradicate any possibility of accidental escape of oil into the environment, have yet to be developed.

The three-week seminar began discussions on Monday on a national oil spill contingency plan.

Much of the pollution is caused by shipping and maritime activities, Mr. Loustau-Lalanne told the audience, who included members of the diplomatic corps and officials from the Government and parastatals.

Organised and financed by the International Centre for Ocean Development (ICOD), the 18-day training seminar is being attended by some 50 people from the Port and Marine Services, tourism division, local petroleum companies, Department of Industry, Public Utilities Corporation, Department of Environment, Seychelles Fishing Authority, emergency services and the meteorological office.

Noting that Seychelles relied on the marine environment for food and tourism, the principal secretary said that it is because of this that environment preservation is the country's foremost priority.

Efforts towards this end have been made at the national, regional and international levels, he said.

Mr. Lalanne also said that the oil spill contingency plan is one of the projects envisaged by the Environmental Management Plan, and a proposed plan has been drawn up with help from the Canadian Centre for International Fisheries Training and Development and ICOD. [passage omitted]

SOUTH AFRICA

Waste From Copperbelt Mines Said Affecting Cattle, Fish

MB0301135992 Johannesburg SAPA in English
1147 GMT 3 Jan 92

[Text] Lusaka, Jan 3 (SAPA)—Dangerous waste from mines and industries in Zambia's Copperbelt may be responsible for the unexplained deaths of scores of cattle and fish, and the scorching of vegetation, in the country's southern province.

The country's minister of environment, Mr. Keli Walubita, announced in Lusaka on Friday that he had sent a natural resources pathologist to the area to assess the ecological disaster and to establish the nature of the disease.

Information he had received so far indicated that the Itzhi-Tezhi dam had been contaminated with dangerous waste from mines and industries operating in the Copperbelt, Mr. Walubita said.

The dam was littered with floating dead fish, and villagers had lodged a complaint to the government of increased animal deaths since the middle of last month.

The Kafue is one of the most heavily polluted rivers in Zambia—and possibly in the entire sub-region, Mr. Walubita said.

As from next week his ministry would enforce the Environment Protection and Pollution Control Act of 1990 to ensure proper disposal of industrial waste.

There was a concentration of waste in the dam because the water was not flowing quickly enough into a reservoir, according to some specialists.

Drought Expected To Worsen in Matabeleland Area

*MB0901135592 Johannesburg SAPA in English
1235 GMT 9 Jan 92*

[Text] Matabeleland 9 Jan (SAPA)—Prospects of yet another year of drought in Zimbabwe's Matabeleland-South Province is causing concern among the region's poor, reports ZIANA National News Agency.

"This year is likely to be a disaster of 1983 proportions, if not worse," said Dumisani Khumalo, provincial project coordinator of World Vision, an aid agency.

Memories of that devastating drought, the worst recorded, still linger in the minds of villagers here. They fear 1992 might turn out to be worse if the scorching spell continues.

In Gwanda and parts of the Filabusi Districts, fields ploughed last October—the start of the rainy season—lie empty and plain.

The Mopani forest grazing areas are parched and livestock are beginning to die a slow and painful death. Most granaries are empty.

Meanwhile doubts exist about the resumption of the government-sponsored drought relief programme with reports that national grain silos are also empty.

Zimbabwe was forced to import 1,200 [metric] tons of maize from South Africa to meet the current national shortfall.

Malnutrition among children under five years of age has shot-up from 13 percent to 32 percent, according to a health official in the area.

"Most feeding projects have folded because the current water shortage affected the gardening projects of non-governmental organisations," he said.

Normally, at this time of the year even during bad years, there is always something to salvage from the fields—pumpkin leaves, cucumbers, sweet water melons and sweet canes—to keep the people going until harvest.

But not this year, says Misheck Ndlovu, a district councillor.

He said the situation was generally the same throughout the six districts in Matabeleland-South Province.

Drought, Government Policies Responsible for Grain Shortfall

*MB0901135092 Johannesburg SAPA in English
0726 GMT 9 Jan 92*

[By William Bango]

[Text] Harare Jan 8 (SAPA)—Zimbabwe, once a monument to Africa's enormous agricultural possibilities, looks set to join the long and growing list of thirsty and hungry nations this year.

Time appears to be running out for the worried farmers who, with specialised seed, fertilisers, pesticides and expertise, are still waiting for the rains.

Masvingo, a large province in the south, lost 7000 head of hungry and weak cattle last month. Manicaland farmers have not even planted a furrow. Grain stocks have reached the lowest level in 10 years.

Two major cities, Mutare and Bulawayo, are like the rest of the countryside battling a severe water crisis.

A second consecutive year of drought, which means less water and expensive food, will plunge the country into chaos and distort the new economic reform programme launched by the government last year to steer the country towards market-led growth.

Zimbabwe, coordinator of the Food and Security Section in the Southern Africa Development Coordination Conference, has now been forced to set aside ZD [Zimbabwe dollar] 75.5 million for maize imports to bridge the gap in expected shortfalls next month.

This grain deficit, the second in 11 years, appears to have come as a surprise due to a combination of erratic weather patterns, policy mishaps and poor crop forecasting.

"The whole story really relates to the pricing policy of the government," said Mr. Alan Burl, president of the Commercial Farmers' Union, in a television programme.

The country entered 1990 with a surplus and estimates showed yet another maize glut last year, a case considered undesirable and costly. With intakes ranging from one to 1.5 million [metric] tons a year, storage expenses normally exceeded ZD40 million.

Further, pressure was exerted on the Grain Marketing Board (GMB) to clear these stocks as they were seen by producers as impeding the introduction of higher producer prices, said Mr. Cephas Msipa, the GMB chairman.

The board immediately adopted an aggressive export drive, capitalised on improved transport networks and sold, through international donor agencies, large quantities to Harare's agriculturally-anaemic neighbours.

"Unfortunately, for some reasons still not clear to the board, the crop forecasts were far off the mark," said Mr. Msipa.

He admitted that drought aside, the blame lies on bad forecasting and unreliable early warning systems here. Dangerous, but irreversible, commitments had already been made at a time when the actual intake was found to be 66 percent of the estimated crop deliveries.

Today, Zimbabwe has to spend an unbudgeted ZD75 million on 150,000 tons of South African maize to contain a pending, man-made crisis.

The story of grain production in Zimbabwe is as interesting as the sudden, looming food insecurity. Much can be traced to October 1986 when, in a surprise policy shift, the government ordered farmers to cut maize production by 50 percent or risk serious economic penalties.

This resulted in a 40 percent cutback on commercial production despite the fact that the move was taken barely two years after Zimbabwe had spent ZD80.5 million on grain imports during the 1984 drought.

The land planted to maize dropped from over 250,000 hectares to less than 100,000 hectares in 10 years as more land has since been set aside for horticulture, oilseeds, game ranching and other activities.

The new trend may bring financial windfalls, but it is set to backfire. Maize is a staple.

With an annual population growth rate of 3.4 percent, Zimbabwe has to plan for an additional 340,000 mouths to feed every year. Such a provision has to be made, apart from its regional obligations.

To large farmers, diversification was possible, but painful. It was not easy for most to shift maize from its traditional number two position (after tobacco) because of years of conditioning and attitudes.

But, for the communal farmer, it was extremely difficult to change because of poor soil and small land sizes. They could neither breed crocodiles nor capture and auction ostriches for a living.

However, the government policy decision was reversed a year later when granaries were hastily depleted through local consumption, exports and donations. This was in November 1987.

Another bumper harvest was soon realised and Zimbabwe entered a new decade happily. But, this was shortlived. The GMB was soon under pressure to clear the grain bins through exports. And, within 12 months, Zimbabwe again was in trouble.

The export aggression led to an overnight deficit, forcing the nation to cancel export commitments in January last year and further sliding into grain debts with its neighbours in 1992.

The situation is so serious that President Robert Mugabe, in his new year message to the nation, had to appeal to farmers' sense of morality to fight hunger.

But according to the farmers, the issue goes beyond moral values, the government needs to have a clear grain policy for Zimbabwe to regain its much-coveted position as Africa's food showcase.

Next Decade's Environmental Strategy Viewed
40101009A Beijing CHINA DAILY in English 5 Dec 91
p 1

[Article by Hong Xia]

[Text] The Chinese authorities will focus their effort on technological renovation in tackling the country's environmental problems in the coming decade, Qu Geping, China's top environmental official, told a news conference in Beijing yesterday.

By the year 2000, the total volume of industrial liquid waste will be under 32 billion tons, 3.4 billion tons less than in 1990.

The treatment rate of liquid industrial waste is expected to be raised to 82 percent, compared with 32 percent last year.

Some 320 million tons of industrial solid waste, or 37 percent of the total, is to be recycled, which is eight percent more than last year. Around a quarter of urban sewage will be treated by the year 2000.

Gas for cooking and heating will be available to 60 percent of urban residents, a fifth more than last year, and the central heating system will cover 470 million square metres of accommodation, 2.4 times the figure in 1990.

The noise level of 60 to 70 percent of trunk roads will be kept under 70 decibels and the same percentage of cities will meet noise pollution control standards.

To fulfill these standards, said an official report, China will encourage the development of enterprises with advanced technology and high efficiency.

By contrast, expansion of enterprises with serious pollution problems, high energy consumption and raw material waste will be strictly controlled.

So will the random development of small industrial boilers. Central heating systems with regional heating centres and integrated heating and electricity supply will be established in order to effectively minimize the discharge of pollutants into the atmosphere. Regional and centralized sewage treatment systems will also be established to raise water quality to the required standard.

Treatment sites and recycling facilities for solid waste will be set up to ensure effective centralized control.

Money for pollution control and ecological protection will be guaranteed and loans for this sort of work will have lower interest rates.

By the turn of the century, according to the report, an additional area of nearly 45 million hectares will be afforested, raising the country's forest coverage to 164.2 million hectares, or 17 percent of land area, compared with 13 percent in 1990.

And 20 million hectares of land suffering from soil erosion will be treated.

To achieve these goals, cultivation of fast-growing timber, and shelter-belt, cash-crop and firewood forests will be accelerated. Random and unauthorized tree felling will be prohibited.

Clean Development, Exploitation of Coal Stressed
40100011B Beijing XINHUA Domestic Service
in Chinese 8 Dec 91

[Commentary: "It Is Necessary To Pay Great Attention to Clean Development and Exploitation of Coal"; by XINHUA reporter Yang Zhaobo [2799 0340 3134] and trainee Lang Guohua [6745 0948 5478]]

[Text] Beijing, 8 December (XINHUA)—Coal constitutes 75.6 percent of China's energy resources, a much higher percentage than the world average, which is 28 percent. Because of our poor technology and other backward conditions, pollution in coal consumption is serious and large amounts of carbon dioxide are exhausted. Various inspections and tests show that atmospheric smoke pollution has become a condition for developing cities in Northern China and industrial areas throughout China.

At present, more than 90 percent of China's coal is still burning directly. As a result, our heat efficiency of coal has not been markedly raised, while our coal consumption is rising at high speed each year. Atmosphere over some industrial cities still contains large amount of bisulfides and dioxides. According to experts' preliminary forecast, in 2030-2050, coal demands by our country will remain more than 50 percent as a direct energy resource. If we fail to make any remarkable breakthrough in clean exploitation of coal, our environmental pollution will worsen to an unbearable point.

Experts, deeply worried about the situation and prospects, point out that China's current situation in exploitation energy resources must improve and as soon as possible a long-range plan on the technology of clean development and exploitation of coal must be drawn up that suits our national conditions. It is necessary to conduct an overall study on the estimates of coal resources, coal production, processing, exploitation, and pollution control. It is particularly necessary to stress coal washing, dressing, and processing. We should strive to reduce end uses of coal, such as direct burning and separate burning, and increase proportional use of electric power, heat, gas, and other clean, highly efficient indirect energy resources derived from coal.

Today, it is necessary to build China's coal dressing technology system in accordance with the varieties of coal, the characteristics of our coal quality, and our market demand. It is particularly necessary to conduct research on the advanced technology of desulfurization before coal burning, and the new technology of coal for industrial and residential uses.

Experts have made a few suggestions which merit our reference and adoption:

1. Study and disseminate fluidized-bed boiler technology. Because this new technology can increase the burning efficiency of coal to more than 99 percent, sulfur contained in

coal is adsorbed by limestone in the course of burning, and the temperature while it is burning is lower than the formation point of nitrogen and oxygen compounds, thereby greatly reducing the discharge of contaminated substance in smoke.

2. China should make great efforts to develop the new technology of coal gasification and liquefaction, achieve the domestication of its equipment production as soon as possible, greatly reduce the atmospheric pollution in coal consumption, and alleviate transport stress. In addition, it is necessary to develop gas combined cyclic electricity generating, a method which can increase the efficiency of power supply to 38 percent to 43 percent and an internationally acknowledged technology orientation for thermal power plants.

3. In coal-rich and oil-hungry areas, we can build complexes capable of producing methanol or mixed alcohol or co-producing gas for urban consumption. In Shanxi, a province which abounds with coking coal resources, we can build coking coal refining—chemical industry bases. In Wuda mining district, Inner Mongolia, where coal, electricity, water and limestone resources abound, we can build large calcium carbide industry bases.

4. Thermal power plants are the biggest sources of atmospheric pollution. In addition to developing power generating technology which discharges less pollution, we must also study the technology of purifying smoke. At present, the technology of desulfurization and dust elimination has ripened, and the technology of denitrification has also been commercialized; however, their costs are very high. We should proceed from China's specific conditions and actively study the development of an economical and effective smoke-purifying technology.

Experts also pointed out: While we persist in developing and conserving energy resources at the same time, we must make efforts to control the total amount of coal directly exploited as fuel. We must strive to advocate energy-conserving production and lifestyle and by using our scientific and technological achievements to promote revolution in energy resources technology, reach higher production efficiency and living standards on a lower energy-consuming basis. We must readjust the composition of our energy resources, speed up the development of natural gas and hydropower stations, actively develop nuclear energy, and increase the proportion of energy resources cleanly developed and exploited directly from coal.

Beijing Improves Municipal Environmental Protection

*OW0801083092 Beijing XINHUA in English
0731 GMT 08 Jan 92*

[Text] Beijing, January 8 (XINHUA)—Beijing has become cleaner and quieter since 10 tasks concerning environmental protection set by the municipal government in 1991 were fulfilled in time.

Because of these efforts, smoke control in the whole of the urban area has been further improved to 70 percent, and the availability of the control in rural areas has been raised from 50 percent to 70 percent.

The central heating area has increased by 2.1 million sq m [square meters], and 85,000 households now have piped gas. In addition, 26,000 vehicles have been checked for exhaust fumes.

The city planted a total of 1.84 million trees during 1991 and 1.24 million square m of grass, expanding the green area by 3.21 million sq m.

A total of 100 sealed garbage stations were built and 20,000 rural toilets in the area of the Miyun Reservoir—the major source of water for Beijing—were made pollution-free.

A total of 74 high-pollution spots were cleaned up and another 96 were improved.

'Key' State Project Will Study Weather Forecasts, Global Climate Changes

*OW1001143592 Beijing XINHUA in English
0841 GMT 10 Jan 92*

[Text] Beijing, January 10 (XINHUA)—China will pool scientists together to study weather forecasts and changes in global climate, and their impact on China.

A feasibility report of the study passed expert appraisal recently and the project was listed by the State Scientific Commission as a key state project during China's Eighth Five-Year Plan period (1991-1995).

The study will mainly concentrate on five subjects and will be taken up by over 500 experts from 20 research institutes under the Chinese Academy of Sciences, the National Meteorological Bureau, the Ministry of Agriculture, Ministry of Forestry, the State Environmental Protection Bureau and the National Bureau of Oceanography.

The project is aimed at accurately determining density, changes, and discharge of carbon dioxide, methane, and nitrogen oxide in the air of six typical areas in China; to improve the existing models for the global and regional climate and forecast the trends in climate changes in each of the next five decades; to set up appraisal models for the impact of climate on China's agriculture, forestry, water resources, natural environment and the sea level; and to work out coordinated policies on the development of China's major regions.

Changes in climate worldwide have been a major concern of environmental issues of the international community. Because of the development of industry, the average global temperature has risen by 0.3 to 0.6 degrees centigrade over the past century. This is probably the cause of the elevation of the sea level and frequent natural calamities.

In December, 1988, the United Nations passed a resolution calling for concerted efforts by all countries on the protection of the globe.

Since China is vast and with a long coast line, and since agriculture is a very important sector in the national

economy, the Chinese Government has attached great importance to the global climate.

In 1990, the State Council set up a coordination group for the study of climate changes in China, which carried a number of studies and worked out several new policies.

Official Assesses Three Gorges Project's Ecological Effects

*OW1601015592 Beijing XINHUA in English
0118 GMT 16 Jan 92*

[Text] Beijing, January 16 (XINHUA)—The proposed Three Gorges Project, China's largest multipurpose water conservancy project on the Yangtze River, would have both positive and negative impacts on local ecology and environment, said 80-year-old hydraulics expert Yan Kai.

The Chinese expert expressed his viewpoint in an article carried by "PEOPLE'S DAILY," China's leading newspaper, Wednesday.

According to Yan, the Yangtze River Valley is one of the most developed areas of China, and the country's population growth and economic development during the past decades have put an increasingly heavy burden on the environmental and ecological system in this area.

So the problem of the environment should be taken into serious consideration in further development of this area, the senior expert said.

The positive impact would be the effective control of devastating floods on the lower and middle reaches of the Yangtze and its benefits in the prevention of schistosomiasis in the area, the expert wrote.

The proposed Three Gorges Hydroelectric Station will have a total designed generating capacity of 17.68 million kw [kilowatts], with an annual electrical output reaching 84 billion kwh [kilowatt-hours], the equivalent of saving 50 million tons of coal every year in thermal power.

The hydroelectric power to be generated will be much less polluting than building coal-fueled thermal power stations, Yan said.

In addition, the project would be able to improve the local climate, reduce mud and sand accretion in Dongting Lake, and adjust water flow in the Yangtze River.

However, the senior expert admits that building the project would be at the cost of submerging some arable land, scenic spots and ancient tombs of the area, and the dam would also influence the breeding grounds and the traditional living conditions of some rare animals.

He said that some new scenic spots would emerge after the old ones are submerged, and he suggested that some remedial measures should be taken to move some ancient tombs and to protect the valuable wildlife.

Yan's article also gave detailed analysis on a series of problems that the proposed project would face such as the resettlement of a large number of local people displaced by the reservoir, the position of the super-dam, possible landslides, and mud and sand accretion.

He said that the proposed Three Gorges Project, if constructed, will have more positive impact on the local environmental and ecological conditions than negative, so he suggested that the project be constructed as soon as possible.

Yangtze Forest Shelterbelt Progress Continues

*OW1701142792 Beijing XINHUA in English
1358 GMT 17 Jan 92*

[Text] Beijing, January 17 (XINHUA)—China has planted 1.87 million ha of trees in the forest shelterbelt along the upper and middle reaches of the Yangtze river in the past three years, up 83 percent over the plan, according to the Ministry of Forestry.

The construction of the shelterbelt, an early stage of the Three Gorges Project, will help harness the Yangtze, the longest river in China and third-longest in the world, and make it better serve the national economy, ministry experts said.

The Yangtze's drainage area of 1.8 million sq km generates 40 percent of the national industrial output value and 34 percent of the agricultural output value.

However, for a long time, vegetation along the upper and middle reaches of the river has suffered severely owing to irrational farming and excessive felling of trees. The ecological environment has been damaged, resulting in a yearly soil erosion of 2.24 billion tons and a direct economic loss of several billion yuan every year.

To harness the river and reduce the occurrence of natural disasters in the Yangtze river valley, China began the construction of the forest shelterbelt in 1989. The project expanded into nine provinces the following year after trials in six provinces.

Besides the forest shelterbelt, the Chinese people have also planted 467,000 ha of timber forest and 267,000 ha of cash-crop trees, and built or restored more than 2,000 rural tree farms along the river.

According to statistics, nine provinces have pooled 110 million yuan for the construction so far.

Starting this year, ministerial officials said, China will strive to plant at least one million ha of trees annually, fulfilling the target of seven million ha of forest area three or four years ahead of time.

State Calls for Chinese Youth To Participate in Environment Campaign

*HK2001090092 Beijing CHINA DAILY in English
20 Jan 92 p 3*

[By staff reporter Zhu Baoxia: "Youth Told To Play Role in Keeping Earth Clean"]

[Text] Chinese youth are being called upon by the State to participate in a year-long national campaign to preserve the environment.

The campaign, which is to be launched next month, is jointly organized by the National Agency of the Environmental Protection Administration (NAEPA) and the Central Committee of the Communist Youth League of China.

It is designed to enhance the nation's consciousness of the environment and to mobilize young people—and people from other walks of life—to help keep watch over the country's administration in this field.

Luo Sang, an official from the Communist Youth League, said in a press release on Saturday in Beijing that environmental protection is one of the State's basic policies and all teenagers and youth league members are duty-bound to contribute their utmost to this policy.

He stressed that youth league branches from across the country must put environmental protection education and publicity on the top of their work agendas.

Effective methods must be found to inform more young people about the State laws and regulations concerned, especially the four State laws on preserving the environment, oceans, water and air.

According to a recent report from the NAEPA, the country's large cities still suffer from heavy air pollution and the situation in small cities is worsening. More domestic sewage was drained into local rivers, contaminating tap water supplies.

In 1990, large factory chimneys churned out some 8,500 billion cubic meters of waste gases, a 2.8 percent increase over 1989. Some 15 million tons of sulphur dioxide and 21 million tons of industrial dust were spewed into the sky.

Northern cities were more polluted than those in the south, with an average in the north of 475 micrograms of suspended particles per cubic metre, 44 percent more than their southern counterparts.

Council for International Environmental Cooperation Set Up

*OW2201122192 Beijing XINHUA in English
1146 GMT 22 Jan 92*

[Text] Beijing, January 22 (XINHUA)—The Chinese government has decided to establish the China Council for International Cooperation on Environment and Development, a Chinese official said here today.

According to Song Jian, state councillor and chairman of the newly-established council, the council will consist of about 40 members. The Chinese members will be of ministerial and vice-ministerial rank from the key ministries and agencies concerned with environment and economic development, together with several eminent Chinese scientists.

"The international members will come from developed countries, developing countries and international organizations and will be of comparable stature to the Chinese members," Song noted.

With the approval of the Chinese government and following the recommendations by the Chinese and international parties, Marcel Masse, president of the Canadian International Development Agency (CIDA), Qu Geping, head of China's State Administration of Environmental Protection, and Gu Ming, a noted Chinese economist, have been chosen as vice-chairmen.

According to Song, the council is a high level advisory body which will make constructive proposals and recommendations on the integration of environment and economic development for consideration by the Chinese government.

The council will also encourage the support of the international community for China's efforts to protect the environment and to conserve energy and natural resources, by promoting international financial support, open scientific exchange and technology transfer.

Cida has agreed to provide five million Canadian dollars to support the work of the council. Ford and Rockefeller Foundations have also agreed to give some financial support to the council.

REGIONAL AFFAIRS

Japan To Sign Environmental Accord With South Korea

OW1201005692 Tokyo JIJI in English 1327 GMT
11 Jan 92

[Text] Tokyo, January 11 (JIJI PRESS)—Japan will conclude an environmental cooperation agreement with South Korea when Prime Minister Kiichi Miyazawa visits Seoul for three days from Thursday, a government source said Saturday.

The government hopes to develop bilateral environmental cooperation into global cooperation, the source said.

The South Korean Government, which proposed the agreement, named prevention of industrial pollution like water and air pollution, energy saving and waste disposal as areas to be covered by it.

The Japanese Government hopes to add cooperation in broader issues, such as joint research on prevention of the warming of the earth, oceanic contamination and acid rain, the source said.

The agreement will also spell out the establishment of a joint committee headed by the top environmental administration officials of the two countries to keep close contact for cooperation.

Japan has concluded similar agreements with the United States and the former Soviet Union.

Japan To Propose ASEAN Facilities To Combat Oil Pollution

OW1801035392 Tokyo KYODO in English 0240 GMT
18 Jan 92

[Text] Tokyo, 18 Jan (KYODO)—Japan is to propose a plan to construct joint facilities in Southeast Asia to fight oil pollution, such as ocean spills from damaged oil tankers, Transport Ministry officials said Saturday.

The initiative will be presented to a meeting of experts from Southeast Asian nations and Japan which will be held in Manila January 30-February 1, the officials said.

The facilities include a center operated by oil experts and a terminal stocked with oil booms, oil-contaminated water recovery units, and other oil treatment equipment, they said.

The Japanese Government is to finance construction of the facilities, to be operated by the six members of the Association of Southeast Asian Nations (ASEAN) after completion, the officials said.

Japan, which gets much of its oil from tankers that pass through the region, has been studying joint operations to fight oil spills since international concern grew in the wake of a huge oil spill in Alaska in March 1989, they said.

Suharto Suggests Common ASEAN Stand at Brazil Summit

BK2001091792 Jakarta ANTARA in English 0833 GMT
20 Jan 92

[Text] Jakarta, January 20 (OANA/ANTARA)—President Suharto said here on Monday the Association of Southeast Asian Nations (ASEAN) should have a common stand in the conference on environment and development in Brazil in June this year.

"The head of state said Indonesia should strive to make the summit in Brazil successful and for that it is necessary to consolidate views from within ASEAN and other regional organizations," State Minister for Population and Environment Emil Salim said after meeting President Suharto.

Emil Salim saw the president to report about the importance of consolidating views from ASEAN and other regional organizations so that the meeting would not come to a failure.

All head of states and governments are invited to attend the meeting which is scheduled on June 1-12 but the United States for example have shown no interest in the conference because there will be general elections in that country and because that country is busy recovering its economy while the European Community is concentrating on developing the European single market.

"Our worries are that the summit meeting in Brazil will be too ceremonial while the fact is the participants are expected to solve financing problems of conservation and mechanisms of technology transfer," he said.

In connection with consolidation efforts ASEAN ministers in charge of environment plan to hold a meeting in Singapore on February 17-18 and in the near future several officials from Malaysia will come to the country to discuss the same issue.

President Suharto said it was necessary to confront development against conservation efforts.

"Development accommodates environmental considerations and, therefore, there is no need to put the two factors in confrontation with each other," Emil Salim said quoting the president.

President Suharto said there was no need for the developing and developed nations to get involved in confrontation in handling living environment and nature conservation problems, adding it was consultations and cooperation that was necessary.

UN Environmental Project To Include PRC, Mongolia, Koreas

SK2101042592 Seoul THE KOREA HERALD
in English 21 Jan 92 p 2

[Text] A \$3.7 million project for environmental protection in Northeast Asia, in which China, Mongolia and South and North Korea will participate, is being pushed by the UN Development Program (UNDP), the Foreign Ministry said yesterday.

The UN agency is also working on the formation of a regional intergovernmental body to promote environmental protection among the four countries.

A ministry official said the two projects are expected to be formally adopted in an Asian regional meeting of the UN body which opened in Manila yesterday. The meeting will also decide details including the budget, he said.

He said the four countries concerned agreed in principle on the project on joint environmental study during a UNDP meeting in Ulaanbaatar in July 1991, which focused mainly on the Tumen River development project in North Korea.

The concrete programs to be covered in the joint environmental project include the development of technology to improve the energy efficiency of stoves, exchange of information on air pollution in cities, and studies on transboundary air pollution, clean-coal technology and coal gasification, the official said.

The budget, tentatively set at \$3.7 million, is subject to review at the Manila meeting, he said. The Global Environment Facility (GEF), a \$1.5 billion fund jointly formed by the World Bank, the UN Environment Program (UNEP) and UNDP for global environmental protection projects, is expected to render financial support to the project, according to the official.

Under the plan, UNDP representatives residing in the four countries are to begin drawing up detailed programs in March and submit the report to the UNDP headquarters by May, he said.

The agency will put into force the project in July in cooperation with the countries, the official said.

The Korean government likes to discuss with China the issue of migration of air polluting materials from China to Korea in the course of carrying out the project, he said.

Concerning the intergovernmental environmental body among China, Mongolia and South and North Korea, the official said the four countries have already agreed on its necessity.

BURMA

Official Explains Burma's Environmental Protection Strategy

BK1301122392 Rangoon Radio Burma in Burmese 1330 GMT 12 Jan 92

[Excerpts] U Ohn Gyaw, minister for foreign affairs and chairman of National Environmental Protection Commission [NEPC], this morning invited the heads of diplomatic missions based in Yangon [Rangoon] and the heads of United Nations agencies to the Hlawga Park to explain the effective environmental protection measures carried out by Myanmar [Burma]. [passage omitted on persons attending ceremony]

U Thein Lwin, director of Wild Life and Sanctuaries Preservation Sub-Department under the Department of Forests, explained the environmental protection measures to the guests at the lawn in front of the nature preservation museum in Hlawga. He said the administration, extraction,

and use of forestry products in Myanmar had not affected the environment. This practise had originated with the use of the term 'royal' for the teak tree during the reign of King Alaungpaya and the constituting of the Yadanabon capital as a sanctuary during the reign of King Mindon. He added that today's world biological and environmental protection strategy coincides with the 130-year old system the Forestry Department has been following. He said the Alaungdaw Kathapha natural park is significant proof that although timber has been extracted until today, Myanmar has maintained the stability of the environmental and biological systems. He finally stressed that one country's efforts are not sufficient to protect the world's vast natural resources and the collective efforts of the world family are needed to hand over an unspoilt environment to the future generation. [passage omitted on tour of Hlawga park]

The ministers, heads of diplomatic missions and UN agencies, and invited guests left Hlawga Park in the afternoon.

Myanmar has been giving priority to environmental protection activities. Thus, for more effective environmental protection activities the NEPC headed by Foreign Minister U Ohn Gyaw with 21 members and four other supporting work committees—the Natural Resources Preservation Committee; the Environmental Pollution Protection Committee; the Research, Educational and Information Committee; and the International Relations Committee—were formed in February 1990.

At the national level, the NEPC has been implementing environmental protection awareness plans. At the regional level representatives have been sent to attend seminars and international forums. Environmental protection training programs for employees of various ministries are also being planned. Necessary preparations are being made for the UN Environmental Protection and Development Congress to be held in Brazil in June 1992.

JAPAN

Toyota To Recycle 85 Percent of Auto Materials in 1996

OW1601123592 Tokyo KYODO in English 1024 GMT 16 Jan 92

[Text] Nagoya, January 16 (KYODO)—Toyota Motor Corporation will begin recycling 85 percent of all materials used in building an automobile in terms of weight when it introduces new models in 1996, company officials said Thursday.

The company currently recycles 75 percent of the total weight of materials used in the production of a vehicle, the officials said.

Toyota has an action plan to work closely with parts suppliers and partners to develop new technologies to safeguard the environment, they said.

It will also give priority to minimizing gas emissions and developing cars that run on alternative energy sources, such as electricity.

The company will also develop and implement production processes that will enable the reuse of materials and maximize energy efficiency, the officials said.

Toyota plans to recycle plastics parts, including car bumpers, and develop recyclable materials to safeguard the environment, the officials said.

Diesel Truck Manufacturers Urged to Lower Nitrogen Oxide in Exhaust

OW1601142292 Tokyo KYODO in English 1321 GMT 16 Jan 92

[Text] Tokyo, January 16 (KYODO)—The director general of the Environment Agency called Thursday on four manufacturers of diesel trucks to do their utmost to develop technology for lowering nitrogen oxide in exhaust fumes, agency officials said.

Shozaburo Nakamura made his appeal to the presidents of the four diesel truck makers when they visited the agency upon his invitation.

In 1989, the agency's central council for environmental pollution control submitted a report calling for a 30 to 60 percent reduction in nitrogen oxide by 1999.

But prospects are dim that the target will be met by that time, industry analysts said.

Nitrogen oxide controls on diesel trucks are lax compared to restrictions on gasoline-powered vehicles, Nakamura said.

The public feels the diesel pollution situation is abominable, he said.

"The problem can no longer be ignored. We want the diesel industry to strive for an early attainment of the targets," he said.

Pollution Control Equipment Orders Soar

OW2101101392 Tokyo KYODO in English 0930 GMT 21 Jan 92

[Text] Tokyo, January 21 (KYODO)—Orders for pollution control equipment soared to a record high in November amid the growing awareness of environmental problems, the industrial machinery industry reported Tuesday.

The Japan Society of Industrial Machinery Manufacturers (JSIMM) said orders for environmental protection equipment received by its member firms in November increased about 3.5-fold over a year earlier to a record 154.6 billion yen.

The association attributed the sharp rise to a nearly 10-fold increase in the value of orders for waste disposal equipment to 109.2 billion yen.

Association officials said the growing awareness of the need for environmental preservation and a dramatic increase in industrial and household waste in urban areas are responsible for the increase.

By category, orders for water pollution control equipment accounted for 32.8 billion yen, up 21.4 percent, while those for air and noise pollution control facilities were up 84.6

percent and 87.6 percent respectively at 11.7 billion yen and 700 million yen, the association said.

SOUTH KOREA

Government's Preliminary Report for UNCED Outlined
SK0901021992 Seoul THE KOREA TIMES in English 9 Jan 92 p 3

[Text] South Korea is fully aware of the desperate need to pursue sustainable development and has eagerly been playing a responsible role in efforts to preserve the environment, the Environment Ministry said.

In a recent report to the United Nations Conference on Environment and Development (UNCED), the ministry said the government policy has been aided by the recognition of the Korean people that economic growth should not be allowed to cause environmental damage.

It said considerable efforts are concentrated in maximizing resources and reducing the production of waste, as well as effectively increasing the volume of recyclable materials.

The full utilization of market mechanisms, such as the principle of marking polluters pay for environmental damage, are in place to reflect environmental costs in consumer and industrial prices, the report revealed.

In the preliminary report to the UNCED, which is scheduled to open its session in Rio de Janeiro, Brazil in June, the ministry emphasized that South Korea has also been making significant investment in research and development programs on environmental management technologies.

Noting that small- and medium-size companies are unable to finance and operate efficient waste treatment facilities, the report said support is being provided to them in terms of allocating low interest loans and offering expert advice on pollution prevention.

In the area of legislation, the ministry explained that a series of revisions have been made to existing laws to endure that further aggravation to current environmental conditions is minimized.

In June 1990, the National Assembly approved some completely new environmental statutes which replaced the Environmental Preservation Act.

These were the Basic Environmental Policy Act, the Air Environment Preservation Act, the Water Environment Preservation Act, the Noise and Vibration Control Act, the Hazardous Chemical Substance Control Act and the Environmental Pollution Damage Dispute Coordination Act.

In addition, the report elaborated, the Solid Waste Management Act, the Marine Pollution Act and the Natural Environment Preservation Act were completely amended last year.

The government has also instituted stiff regulations in areas including air control management, control of total suspended particulates (TSP), motor vehicle emission control, water quality management, protection of water quality management, protection of water supply sources, Sewage and livestock waste treatment and marine pollution.

The ministry stressed in its report that vigorous promotional campaigns to increase the awareness of the general public about nature preservation and environmental protection are in progress.

Coupled with running public interest advertisements through the mass media, the ministry has been conducting environmental education programs to improve the recognition of the values and attitudes as well as knowledge of particular environmental issues.

As a matter of fact, the report pointed out that environmental courses will be introduced as electives in the academic curricula of middle and high schools from 1995.

Confirming its willingness to play an active role in achieving the objectives of UNCED, the ministry accented that the basic for the preservation of mankind, participation and cooperation at the regional, national and even global levels are absolutely essential for the preservation of the world's environment.

Survey Finds Seoul Citizens Plan To Move Due to Pollution

SK2101033892 Seoul THE KOREA HERALD in English 21 Jan 92 p 3

[Text] More than 60 percent of Seoul citizens are found to intend to move out of the capital city mainly because of ever-worsening pollution.

According to a survey, a large majority of Seoul citizens feel the need for the development of government policy to check the population concentration in the metropolitan area.

Many of Seoul's citizens believe it is desirable to build an administrative capital as a means of reducing the increasing population of Seoul, which now accounts for about a quarter of the nation's population of 42 million, the survey said.

The Korean Research Institute for Human Settlements conducted the survey on 3,441 people throughout the country.

The mass migration to Seoul began in the 1950s. Some 24.4 percent of Seoul residents moved to the capital shortly after the Korean War (1950-53) in search of jobs. About 32.2 percent said they came to Seoul because their relatives were living in the city, and 22.2 percent said they moved for better education for their children.

In the 1960s, 50.3 percent of Seoul residents said they moved to the city because of jobs and 26.2 percent said because of their children's education, according to the survey.

Among the people who moved to Seoul in the 1970s, 72.2 percent said they did so because of job opportunities, but the figure dropped somewhat to 45.5 percent in the 1980s. Some 12.1 percent said that they came to Seoul for the education of their children and 21.2 percent for better living conditions.

But 64.6 percent of those living in Seoul now said they want to move away because of the worsening environment. About 41.6 percent of those said they would like to live in a satellite city.

Among those who want to stay in the city, 86.5 percent said they would not move out because of their children's education, the survey said.

Some 89.3 percent of Seoulites, 79.6 percent of residents of satellite cities, and 87.3 percent of residents in the rest of the country said the government should work out measures to help disperse the population away from Seoul.

About 84.6 percent of Seoulites, 83.2 percent of Kyonggi-to residents, and 90.3 percent in the rest of the country said government and other public organizations should move to provincial areas to reduce Seoul's population, the survey added.

MONGOLIA

New Map Evaluates Gobi Desert Ecosystems, Resources

LD1701004992 Moscow TASS in English 0848 GMT 16 Jan 92

[By Kaztag correspondent Leila Tulebayeva—TASS]

[Text] Alma-Ata, January 16 (TASS)—Kazakhstan specialists, together with their counterparts from Mongolia and Austria, have compiled a new map of the ecological evaluation of the natural environment and biological resources of Gobi Desert. The map covers the animal and vegetable kingdom, rivers, lakes, and soil cover of the vast region of Mongolia.

Mongolian and Kazakhstan scientists have been working jointly in a biological expedition for more than twenty years. The results of their research are set out in numerous monographs, thematic dictionaries, and maps.

Kazakhstan specialists have drawn up a master plan for a large Gobi reserve, the establishment of which is provided for by the UN Environment Programme (UNEP).

Practical recommendations for the development and rational utilisation of Gobi's original ecosystems, which have no analogues on the Asian continent, will be worked out for the first time on the strength of the newly-compiled map.

THAILAND

University To Grant Environmental Engineering Doctorates

92WN0207A Bangkok DAO SIAM in Thai 20 Oct 91 p 2

[Text] On 19 October Chulalongkorn University raised the level of its instruction and research in environmental studies in keeping with the urgent needs of the country by readying a program for an engineering doctorate in environmental engineering to start in the next school year so that doctorates could be earned without relying on other countries thus ending a drain on the budget.

Assistant Professor Wongphan Limpaseni, the head of the Environmental Engineering Section of the Engineering Faculty, said that in school year 1992 Chulalongkorn University

would start a doctorate program in environmental engineering for the first time in order to produce skilled engineers to pioneer new fields of knowledge to help in improving and protecting the environment, a critical problem for the country. The program would require students to begin new research in the environment in line with the needs of our country. He felt that starting this new program would pioneer new education in environmental engineering over and above the programs for the bachelor's degree and the master's degree now available and would help reduce the cost for the program by ending the need to go abroad.

Assistant Professor Wongphan also said that the important courses in the program included: "producing high-grade municipal water", "high-grade sewage treatment", "planning a system to treat pipe sewage", "managing air quality," and "managing garbage and hazardous chemicals" etc. Those applying for the program would be required to have a master's degree in engineering in the branch of environmental engineering, public health, or the equivalent, and would be required to have a grade average of not less than 3.5. Three to five students would be accepted.

Bangkok Air, Traffic Pollution Problems Examined
92WN0190A Bangkok NAEO NA in Thai 26 Oct 91
p 10

[Article by Nitaya Mahaphon, Chuthamat Ketthat, and Pranom Phuwanattrai: "Air and Traffic Pollution in Bangkok"]

[Excerpts] [passage omitted] Note: "Air and Traffic Pollution in Bangkok" is an article that was published in the bimonthly journal SAPHAWA WAETLOM of the Chulalongkorn Institute of Environmental Studies. This article was written by Nitaya Mahaphon, an expert in the field of medical engineering who works for the Ministry of Public Health, and Chuthamat Ketthat and Pranom Phuwanattrai, environmentalists with the Ministry of Public Health. The "Social and Environmental" column of NAEO NA feels that this is a very interesting article that should be widely disseminated. Thus, we are reprinting it here. [passage omitted]

Air Pollution in Bangkok

In 1978, there were approximately 500,000 personal vehicles (including motorcycles) in Bangkok. By 1989, the number had increased to almost 2 million, that is, the number quadrupled. Of these, there were about 1 million cars and 1 million motorcycles. That is, there were about an equal number of cars and motorcycles.

Most cars use ordinary or special benzene or diesel. Some cars have been converted to use liquid petroleum gas. Motorcycles use benzene mixed with engine oil. Thus, the pollutants emitted are different depending on the type of fuel used. This can be seen from the fact that black smoke is emitted by vehicles that use diesel fuel, and white smoke is emitted by motorcycles. But both emit pollutants, that is, dust, carbon monoxide, nitrogen dioxide, lead, unused fuel, and sulfur dioxide. The sunlight produces a photochemical reaction in the air, which produces ozone gas and other pollutants.

Analyzing the use of the three types of fuel mentioned above nationwide, it can be seen that the service stations are important distribution points. In 1988, 75 percent of the benzene, 89 percent of the special benzene, and 56 percent of the diesel fuel used nationwide was sold at a service station. And the important users were cars. That same year, the use of benzene increased 56 percent, the use of special benzene increased 39 percent, and the use of diesel increased 54 percent. By comparison, during the previous year, the use of these fuels increased only 5, 16, and 4 percent respectively.

Air quality studies conducted in Bangkok by the Health Department have shown that the amount of dust in the air has frequently exceeded the standards for both the short term (24 hours) and the long term (yearly geometric average). And the situation is growing worse. In heavily congested areas (Pradiphat/Rama 6), the yearly geometric average increased from 190 micrograms per cubic meter in 1989 to 218 micrograms per cubic meter in 1990. This exceeds the standard by 100 micrograms per cubic meter. The situation in the Pratu Nam, Yaowarat, and Sathan Saowapha areas is about the same according to a report by the Office of the National Environmental Board.

Carbon monoxide is a pollutant. The value of this pollutant temporarily exceeds the standard during periods when the traffic is congested. If this continues, in the future, the presence of this gas will increase.

Besides this, reports state that the situation is the same for other types of pollutants such as lead, nitrogen dioxide, sulfur dioxide, hydrocarbons, and ozone gas. This is true even though the levels of these pollutants do not yet exceed the standards. [passage omitted]

It's worth noting that these systems and organs of Thais are fundamentally rather weak. This can be seen from the fact that more people go for medical treatment at a public hospital for respiratory ailments than for any other type of disease. Coronary disease and cancer are the leading causes of death. Living conditions in the city, economic pressures, traffic conditions, and other things clearly show the public health problems. The various diseases mentioned above, including high blood pressure, allergies, and psychological disorders, all put a burden on the government and destroy our human resources. The cost of this is incalculable.

Ideas for Improving the Situation

The communications crisis has caused air pollution and hindered the country's development more than expected. Thus, a way must be found to solve the problem as soon as possible based on the following:

a. We must build a mass transit system capable of moving large numbers of people from where they live to the center. Consideration should be given to small mass transit services for moving people from where they live to the system's main stations. This could include electric vehicles.

b. The traffic routes should be upgraded, particularly in areas that lack secondary roads, such as in mid-level areas.

Alternate traffic routes of great potential must be found, such as water travel. More traffic routes must be built, such as over-the-ground routes.

c. Measures to promote mass transportation and to discourage the use of private vehicles must be implemented. This includes developing the present mass transit system in order to improve services and allow mass transit vehicles to use more traffic routes than other types of vehicles. At the same time, measures should be prepared for the time when vehicles decline in price. The developed countries are trying to make it inconvenient for private vehicles in urban areas by not providing parking spaces, by charging high parking fees, and by setting high motor vehicle fees.

Some cities have closed certain roads in order to stop vehicle traffic, permitting only foot traffic. They have also promoted the use of vehicles that do not use fuel. For example, they have built paths and service sites for bicycles. They have restricted times, areas, and types of trucks. This is one way to reduce the amount of traffic. This should be done in conjunction with designating a suitable center for the transport of goods.

In suitable situations, consideration can be given to using a radio or telephone to call a taxi instead of having taxis cruise about the streets looking for customers, which is the case today. Many of these problems stem from the uncontrolled growth of Bangkok, with urban development depending on the profits of the private sector. There has not been any urban planning, and the state has not provided services to meet demands in keeping with the real situation. Thus, urgent consideration should be given to formulating various development plans, including reducing the central role of Bangkok and dispersing development to other localities. Also, we must quickly formulate and implement urban plans.

Environmental Protection Act Approved

92WN0171A Bangkok NAO NA (LOK THURAKIT SUPPLEMENT) in Thai 14 Nov 91 pp 7, 14

[Excerpt] Mr. Sanao Unakun, the deputy prime minister, discussed the results of the meeting held by the Economic Activities Selection Commission on 13 November. The commission approved the environmental protection act, which has a total of 114 articles. This is a complete draft act that covers all aspects. Once this is promulgated as a law, it will definitely be possible to solve Thailand's environmental problems. There will be units responsible for this, and they will have the proper tools and a support apparatus.

The Environmental Protection Act contains three points. The first concerns improving the environmental management mechanism. It stipulates that there must be unity in formulating policies and raises the National Environmental Commission to the level of a ministry. This environmental commission, which will be headed by the prime minister, will serve as a center for setting policy. More power in carrying on activities will be delegated to the localities. A mechanism will be created for implementing the policies. Operations plans must be formulated at both the center and in the provinces. Budget funds or other funds can be requested in order to implement the plans.

Incentives and environmental restraining measures: A fund has been established to protect the environment. Those who commit violations, such as by creating water, air, or noise pollution, can be fined. Second, the people will be able to participate in solving the environmental problems and file complaints against those who commit environmental violations. Private organizations will help officials carry out things, and they will have the right to request funds to carry on activities.

Third, the act stipulates measures and mechanisms for solving the problems. A pollution control committee will be established. This committee will be chaired by the minister of science, technology, and energy. This committee, together with the units concerned, will stipulate pollution control measures that can be implemented.

This draft act will be submitted to the cabinet and then to the national Legislative Assembly. It is thought that this will be passed into law during the term of this government. A total of 500 million baht has already been allotted for this fund. Once this law goes into effect, Thailand will be able to restore its environment, and it shouldn't take too long to do this. [passage omitted]

Tarutao Islands To Remain 'Closed National Park'

BK0601013492 Bangkok BANGKOK POST in English 6 Jan 92 p 2

[Text] The Agriculture Ministry will retain the policy to preserve the Tarutao Islands in southern Thailand as a closed national park.

The Ministry would not open the Tarutao island group off Satun to Malaysian tourists from Langkawi island owing to "environmental concerns," a source said.

Representatives of the Agriculture Ministry disagreed with the Malaysian proposal that the Tarutao islands become a tourist spot for its citizens who could sail there from Langkawi island, the source said.

During the annual Thai-Malaysian joint committee meeting which will be held on Malaysia's Langkawi island next month, the representatives of the Agriculture Ministry will uphold the policy of maintaining Tarutao as a closed national park and keeping the natural environment on the islands intact and away from the tourist industry.

The Agriculture Ministry has expressed concern over environmental problems which may take place on the islands if it is opened to Malaysian tourists.

However, the Thai side will recommend that Malaysian tourists visit Samui Island in the Gulf of Thailand rather than the Tarutao Islands.

During the last joint committee meeting, Agriculture Ministry representatives expressed their opposition to the Malaysian proposal on environmental grounds.

"The Tarutao islands must be subject to national park laws which need to be reconsidered by the authorities concerned," the source said.

Though it had been concluded in the last meeting that it was "feasible" for Malaysian tourists to visit Tarutao, the Agriculture Ministry delegates have repeatedly expressed concern over the environmental effects the tourist industry may have on the islands.

They said Malaysia has pushed hard for the opening of Tarutao to its tourists in order to promote the tourist industry on Langkawi, a duty-free trading town, south of the Thai islands in the Andaman Sea.

The hotel industry in particular would flourish on Langkawi Island if Tarutao was opened to Malaysians, they argued.

During Prime Minister Anan Panyarachun's recent visit to Malaysia, the matter was discussed, but Thai officials confirmed that there remains a legal problem concerning opening up national parks.

Toxic Waste To Be Shipped Overseas for Disposal
BK1401033392 Bangkok THE NATION in English
14 Jan 92 p A1

[Text] Unable to dispose of its own toxic waste, Thailand has begun to ship it overseas to be destroyed. The Electricity Generating Authority of Thailand (EGAT) has reportedly sent 90 tonnes of PCBs—an extremely dangerous family of chemicals whose use is now outlawed—to France for disposal, and plans to send more. Other organizations are likely to follow suit.

The import and export of toxic waste is highly controversial. Hazardous substances often end up being accidentally spilled, sent to places where they cannot be handled properly, or just dumped at sea. Indeed, EGAT ran into some problems early on in its operation, though by all accounts it was completed smoothly.

But a greater hazard may continue to lurk in Thailand, where thousands of tonnes of PCBs are thought to remain. In fact, no one is exactly sure how much there is, or where and in what condition it is being stored and used.

Most worrisome of all is that few Thai officials—much less citizens—are aware of the dangers PCBs can pose both to the environment and their own health. Many are likely to be threatened with exposure to the carcinogenic substance, or may have been already.

Experts say only one thing is sure PCBs won't go away on their own. They are very stable, and not at all biodegradable. If released into the environment, they contaminate the food chain, often ending up being fed to babies through their mothers' milk.

Cabinet Resolves Against Encouraging Logging in Neighboring Countries
BK1501024792 Bangkok THE NATION in English
15 Jan 92 p A3

[Text] The Cabinet yesterday resolved against encouraging the private sector to carry out logging business in neighboring countries for fear that such business would tarnish Thailand's image and caused a long-term impact on regional environment.

The move followed the concentration of world's environmental campaigns and antitropical timber campaigns conducted by nongovernmental organizations both in Europe and the United States.

The degradation of environment at home forced the government under the former Prime Minister Chatchai Chulhavan to ban logging at home and export of timbers and instead import timbers from neighboring countries including Burma and Laos.

VIETNAM

Case Made for Preserving Tri An, Da Nhim Forest Watersheds
92WN0209B Ho Chi Minh City SAIGON GIAI
PHONG in Vietnamese 18 Nov 91 p 2

[Article by To Thuy Anh: "Tri An and Da Nhim Watershed Forests Must Be Preserved"]

[Text] Although the dry season has not yet arrived, the volume of water flowing into the Don Duong (Da Nhim) and Tri An hydroelectricity reservoirs has diminished and threatens to affect the turbines.

Specialists of the electricity sector said that the main reason for that situation is that the forests protecting the watershed have been practically destroyed and cannot retain the rain water so that it can be controlled in correct accordance with regulations.

One only needs witness the phenomenon of rain water flowing down rapidly, and the shallowness of the dry-season flow caused by rapid silting, to guess right away the true situation of the watershed forests.

In fact, the protective forests of the Tri An and Da Nhim hydroelectricity plants are practically inseparable and merge to form a region called the Tri An Basin, with a total area of about 1.5 million hectares, including all kinds of terrain, from table lands to highlands, ancient eroded hills, lowlands, etc. In the basin as a whole, 70 percent of the forest land is usable for forestry production. It is concentrated in three primary areas; the Da Lat plateau, the Di Linh highlands, and the southern Di Linh low mountain area.

According to forestry researchers, the Da Lat plateau area (including the southern part of the Chu Yang Sinh mid-elevation mountain area) is a vegetation system that has a humid semi-tropical nature in the mountains and is temperate—with a community of conifers, hazel nut, cinnamonum parthenoxylon, "po mu," rhododendron, and mountain anise—at elevations above 1,500 meters, and is a combination of three-leaf and two-leaf conifers and lithocarpus sp. in the hills and valleys at elevations under 1,000 meters. The Di Linh plateau has an evergreen closed-forest vegetation cover and tropical rain and humidity, with distinctive vegetation and the various kinds of oil-bearing plants. The optimal community that is usually encountered is hopea sp., peck wood, umus paroifolia, and "rang rang."

The Southern Di Linh low-mountain area, the Dac Nong plateau, and the remaining part of the Cat Tien hill area has an evergreen closed-forest vegetation system and tropical

rain and humidity. Its vegetation includes the various kinds of primary trees: peck wood, talinum crassifolium, cinnamomum parthenoxylon, and chestnut, and bordering the small valleys are carpets of sawgrass and bamboo forests.

According to the most recent data, from satellite photography, the state of the vegetation cover and soil of the Tri An basin has deteriorated seriously: thick forests cover only seven percent of the area, average forests cover 25 percent, and sparse forests cover 19 percent of the area. Denuded hill land accounts for 19 percent of the area, agricultural land for 18 percent, and the other kinds of land for seven percent.

If one had looked at an aerial photograph map 25 years ago one would have seen only the luxuriant green of a thick tropical forest covering the entire basin.

Some responsible cadres at the Ministry of Forestry have sounded the alarm that the eastern Nam Bo forests have been practically wiped out. A number of valuable timber trees in the Ba River watershed along the border between Thuan Hai and Lam Dong are also being exploited for export. In 1990 Lam Dong alone harvested more than 2,000 cubic meters of those precious woods. Only because of an income of more than 9 billion dong intended to set up a fund to "improve living conditions," everyone, from forestry management specialists to leaders at all levels, agreed to cut down precious trees and destroy forests, which necessitated the sending of more than 40 inspection teams at all levels.

Also in the Tri An basin, a precious santal forest and the Nam Cat Tien National Forest (43,700 hectares) in the northern part of Tan Phu District, Dong Nai Province are being seriously encroached upon.

Protecting the forest cover protecting the watershed is a great task that not only benefits the electricity sector but also has the aim of creating an appropriate forest structure and form a structure to utilize land most rationally throughout the region (forests, perennial agricultural crops, industrial crops, pastureland, etc.), to meet the requirements of balancing the ecological environment (hydrological regulation, water flow, climate moderation, soil protection to prevent soil erosion) and ensuring the operational effectiveness and durability of the hydroelectricity and water conservancy installations throughout the region.

In December 1990 the Ministry of Forestry approved a project to invest in developing the Tri An protective forest area to submit for approval by the chairman of the Council of Ministers. With regard to the urgently needed tasks alone, in a five-year period (1991 to 1995) the investment need will increase to 102 billion dong. In terms of today's money, that estimate is too low.

In the near future we must put an end to the devastation of forests and apply truly strict measures to protect the watershed forests.

Deforestation in Nam Bo Provinces Deplored

92WN0209A Ho Chi Minh City SAIGON GIAI
PHONG in Vietnamese 18 Nov 91 pp 1, 5

[Article by Nguyen Duc: "Will Natural Forests Cease To Exist in Nam Bo By the Year 2000?"]

[Text] What Is the Present Situation of Forests?

It may be said that in comparison to the other areas of the nation, Nam Bo is the area most blessed by nature. In addition to the rice basket of nine Mekong Delta provinces and the industrial crop area in four eastern provinces (Tay Ninh, Song Be, Dong Nai, and Ba Ria-Vung Tau), Nam Bo also has natural forest cover consisting of old-growth forests in the east, extending from the tri-border area to the Ham Tan-Ba Ria coastal area, and in the Bay Nui area in An Giang and the mangrove forests of the Ca Mau Peninsula. Thanks to the flat terrain, fertile soil, and moderate climate, the Nam Bo forests have a very rich variety of flora and fauna.

During the war, no one knew how much of the 29 percent of the nation's forest area that was devastated by bombs, shells, and chemical poisons was in Nam Bo. After the liberation, however, published data revealed that of the 1.5 million hectares of forestry land in Nam Bo (out of a total of more than 6.23 hectares of natural forest), only 830,000 hectares were afforested. The remainder—more than 600,000 hectares—were devoid of forests.

Although there are no specific data, as people who have seen the forests scarred by American land-clearing bombs and chemicals, extending from the tri-border area to Phuoc Long, Binh Long, and Tay Ninh to the Binh Chau-Ba Ria area, we can affirm that the forested area of Nam Bo was one of the areas most seriously impacted by the war.

During the sixteen years since the liberation, the natural forest area in Nam Bo, due to the needs of economic development (building dams and irrigation systems, raising shrimp, and growing industrial crops) has gradually shrunk. Two projects—the Dau Tieng and Tri An reservoirs—have eliminated more than 70,000 hectares of old-growth forests. The development of the rubber-growing area in Tay Ninh, Dong Nai, and Song Be have deforested nearly 75,000 hectares of old-growth forests but has brought into agricultural production only about 5,000 hectares, or 6.65 percent). Building dikes for shrimp raising has destroyed more than 30,000 hectares of mangrove forests. Then there are the migrations to develop new economic zones, haphazard cutting down of trees for lumber, forest fires resulting from inadequate protection, and the burning of forests by ethnic minority people to create slash-burn fields. All of that has resulted in tens of thousands of hectares of natural forests "disappearing" every year. During the war, Tay Ninh Province still had vast old-growth forests, but now it is essentially deforested. In the Bay Nui old-growth forest in An Giang, the hillside forests alone amounted to more than 4,5000 hectares, but now they have practically been wiped out. The area of natural myrtle forests in Minh Hai and Kien Giang amounted to a few hundred thousand hectares, but now only about 10,000 hectares remain in Minh Hai. The Kien Giang myrtle forest has practically ceased to exist. What about the

quality of the remaining forest areas? The good and average forest areas in the eastern provinces declined from 81,000 hectares in 1981 to 49,000 hectares in 1991. The amount of lumber obtained from those areas has declined rapidly. In 1986 306,000 cubic meters were obtained. That amount declined to 248,000 cubic meters in 1990. Many people with responsible positions in forestry estimate that in 1992 practically no exploitable timber will remain in the eastern provinces! In the west, in the natural saline water forest belt, the mangrove forest is the most valuable forest area. But at present, mangrove forests account for only about 30 percent of the total saline water forest area and the average wood reserves have declined by nearly half, from 120,150 cubic meters per hectare to between 70 and 80 thousand cubic meters per hectare. In addition to the shrinking of the forest area and the destruction of ground cover, the various kinds of valuable fauna of natural forests have been hunted haphazardly, to the degree that some are practically extinct. That is according to the recorded data. As for the actual situation, things that cannot be put in the form of statistics—things that are happening and will happen—will certainly be much greater and more serious.

The Strategic Project and Capabilities for Achieving It

The "Draft strategic forestry plan for the Nam Bo region until the year 2000" set forth very encouraging specific goals: putting green cover on the entire area set aside for forestry and restoring the entire natural forest area that has been devastated. By 1995, the volume of wood obtained every year from natural forests will be 137,000 cubic meters of large logs and 290,000 cubic meters of small logs and firewood, and 1.05 million cubic meters of timber will be obtained from planted forests. By the year 2000 the amounts of those types of wood obtained annually will be 137,000 cubic meters, 290,000 cubic meters (the amount obtained from natural forests will not increase), and 2.8 million cubic meters (wood obtained from planted forests will more than double). In order to attain that plan, it is estimated that by the year 2000 a total of nearly 590,000 hectares of natural and planted forests will have been restored, with investment capital amounting to 1,767,177,000,000 dong (the cost at the time the plan was drafted, at the end of 1990). Spread out evenly over 10 years, that averages out to nearly 177 billion dong a year.

With regard to the potential for achieving the project, there are still many topics that must be discussed, such as capability to mobilize capital (nearly 177 billion dong a year); whether or not there is anything contradictory and conflicting between forestry development and the over-all economic development plan; the economic conditions of the region's population, etc. But something that must receive attention is that natural forests—as everyone knows—are many times more valuable than planted forests, but have the limitation of a slow growth rate, so much time is needed to restore them. Some types of valuable wood, such as ironwood, *Sindora cochinchinensis*, and santal wood, can be

harvested profitable after 30 to 40 years of growth. Therefore, the restoration and enrichment of forests in the areas with forests (not to mention deforested areas) cannot be accomplished in a day. However, only four years remain between now and 1995. Setting a norm of harvesting every year more than 400,000 cubic meters of wood from natural forests in the region (after 1995) will result in many people being authorized to exploit forests, while the forests will still be in a devastated state.

To protect the remaining small natural forest area in Nam Bo, we believe that first of all and immediately the state must "close the door to the forests" and forbid all exploitation of wood and the exploitation of flora and fauna on the entire natural forest area in the region for a number of years. It should only all the units to exploit wood in planted forests, in accordance with the principle of only by planting trees can wood be harvested in Nam Bo. With regard to planning, in the region it is also necessary to recalculate the forest development area vis-a-vis the industrial crop area. It should not, because of the goal of expanding the rubber, coffee, and tea areas, destroy the remaining old-growth forests in the region, the value of which, if the plan, including tourism, is carried out well in the future, will be much greater than that of other crops. The remaining problem is that if the planning and restoration tasks are carried out well, but forest protection is bad, there will be no results. One of the effective working methods at present is to assign land and forests to the people living in areas near forests. In the long range, it is necessary to provide jobs and stabilize the people's living conditions in the forest belt, and perform technical plant nursery, afforestation, vegetation protection, and animal protection services. Some people are of the opinion that we should provide people living in forested areas rice "subsidies" sufficient for them to live on, for that would be more "economically effective" than letting them cut down forests to clear land to grow rice, or obtain wood to exchange for rice. Using the forest to nourish the forest is a long-range policy.

Will there still be natural forests in eastern and western Na B in the year 2000? The answer is still in the future.

Afforestation Plan for Coastal Areas Signed

*BK1001154392 Hanoi VNA in English 1500 GMT
10 Jan 92*

[Text] Hanoi VNA Jan. 10—Vietnamese Forestry Minister Phan Xuan Dot and Mr. David Smith, representing the World Food Programme (WFP), signed here today a plan of action for a project on afforestation in Vietnam's coastal areas. The project, codenamed WFP-4304, stipulates that the WFP will contribute US\$ 20,300,000 worth of nearly 116,00 tons of wheat and materials, and the Vietnamese Government, US\$ 8,900,000, to help the population in 13 coastal provinces from Quang Ninh to Thuan Hai plant 125,000 hectares of forests for reducing natural calamity damage, and protecting the environment in the five-year 1992-96 period.

CZECHOSLOVAKIA

Skoda, Siemens Set Up Joint Venture in Energy Generation

92P60087X Duesseldorf *HANDELSBLATT* in German
27 Nov 91 p 26

[Text] The Siemens division of KWU has agreed in principle with the Skoda company of Plzen A.S. and Skoda Praha A.S. to establish a joint venture for the entire field of energy generation. Such an agreement was signed in Plzen, but it still requires the approval of the government of the Czech republic. The planned joint venture intends to offer fossil fuel and nuclear power plants, hydroelectric generators and also modern environmental protection technology for power plants and waste disposal facilities. Thus it will furnish a complete spectrum of products, from development and planning to the delivery of turnkey operations.

The working name for the new company is Skoda Energy. Skoda will take 33 percent of the capital and Siemens/KWU will take 67 percent. According to information from Munich, the share which Siemens will take will also provide for participation by the French reactor manufacturer Framatome, with whom Siemens/KWU has been cooperating in reactor construction since 1989.

From this cooperation, Skoda is hoping for assistance in the task of bringing the northern Bohemian power plants up to the necessary level of environmental technology and in other urgent environmental problems of the CSFR.

Siemens was chosen as the strategic partner for developing the energy business, it is said, because the company, along with Framatome, provides the best qualifications for power plant business on the world class level in the area of nuclear equipment. For Siemens, the cooperation with Skoda is a considerable increase of its involvement in energy technology, not only in Central and East Europe. With this "solid partner" one can tackle larger deals on the world market. During many years of business dealings, one has become convinced of the high technological level of Skoda and the qualifications of its employees, it is said. The predominant share of the management for the joint venture will come from Skoda. The installations and funds to be supplied, as well as the number of personnel, are to be regulated in the coming months. Skoda Plzen was founded in 1859 and is one of the world's most important manufacturers of power plants. The company has a leading position in East Europe in the construction of both conventional and nuclear power plants. Over 7000 persons are employed in Plzen and Prague in the area of energy production.

Slovak Government Approves Clean Air Protection Bill

LD0701183492 Prague Stanice Ceskoslovensko Radio
Network in Slovak 1300 GMT 7 Jan 92

[Excerpts] The Slovak Government today approved the schedule of its legislative tasks for the first six months of the year, which will be added to and brought up to date as necessary. [passage omitted]

With comments, the Slovak Government approved the draft bill on the state administration of the protection of clean air. The amendment specifically delineates the activity of the Slovak Commission for the Environment as the central body of the state administration in clean air protection. It also outlines the activity of the offices for the environment as local administration bodies, the activity of the Slovak Inspectorate of the Environment, and of communities, in the area of clean air protection.

World Bank To Provide Grants for Environmental Projects

AU1401130492 Prague CSTK in English 1441 GMT
12 Jan 92

[Text] Washington, D.C., January 12 (CSTK correspondent)— World Bank officials and Czechoslovak Environment Minister Josef Vavrousek today agreed the terms of two grants designated for environmental protection projects in Czechoslovakia.

The first project concerns eliminating the production and use of freons, commonly used as refrigerants and aerosol propellants and known to be damaging to the ozone layer.

The second involves the protection of timber seedbanks in Czechoslovakia's threatened woodland areas.

Vavrousek, whose four-day trip to the United States ends today, also discussed with representatives of the National Aeronautics and Space Administration (NASA) a joint project in which NASA would prepare satellite photographs of the Czechoslovak landscape, "enabling us to recognize the damage," Vavrousek said. "And on the other hand, we will help the Americans, whose woods are not so destroyed, to identify what the pictures actually show."

Mochovce Nuclear Plant To Generate Electricity by 1994

LD2001122492 Prague Federal 1 Television Network
in Slovak 1830 GMT 14 Jan 92

[Text] The Slovak Republic uses approximately 30,000 GWh of electricity annually, of which more than 70 percent is imported. This unfavorable situation should be resolved with the resumption of Gabčíkovo hydroelectric plant operations, the construction of a steam-gas cycle source, and the Mochovce nuclear power plant's completion. A total of 100 billion korunas is needed to cover the needs of Slovak power production until the year 2005. After the year 2005, the construction of yet another nuclear power plant with an output of 2,000 MW is envisaged.

The most topical issue today is the Mochovce nuclear power plant's completion. The first unit should start generating electricity by the end of 1993. Special stress is laid on safety during this plant's construction, also considered during the drafting of the project's documentation. This work observed

the rules and standards valid in our country, as well as the standards of the International Agency for the Safety of Nuclear Power Plants. Regulations are observed during its assembly and will be observed at the plant's opening. This is where multiple safety systems enter into the game. Most important elements are delivered by the Germany's Siemens company after evaluating the bidding process. It is the automatic system of technology and operations control.

Large attention is also paid to disposing radioactive waste, with the active cooperation of Belgian and French experts. An agreement was signed in Vienna on 10 June 1991 by Austria's Landis and Gyr company and a Czechoslovak partner to import an automated safety system for the Mochovce nuclear plant. The system will be introduced into operations always half a year before the launching of the power unit and will secure the protection and guarding of the plant using technical facilities of a high European standard.

It is interesting to note that 93 villages and towns within a 20km radius of the power plant founded an interest group of Slovak towns and villages of the Mochovce region. They are accepting the nuclear power plant with the low and middle grade nuclear waste disposal site as a fact of life. Nevertheless, they demand guaranteed and unbiased information about the plant's safety and an effective system for protecting the population.

Carnogursky Stresses Need for Completion of Gabčíkovo Dam

*LD2001123492 Prague CSTK in English 1615 GMT
16 Jan 92*

[Text] Prague, Jan 16 (CSTK)—Slovak Premier Jan Carnogursky said today the Gabčíkovo Dam project must be completed as soon as possible to prevent further environmental damage to the Danube River Basin in south Slovakia, where the project is located. "We are interested in finishing the project as soon as possible, so that the damage (to the environment) will not be even greater", Carnogursky told CSTK after meeting with deputies from environment committees of the Federal Assembly (parliament).

The Czechoslovak portion of the Gabčíkovo-Nagymaros Danube Dam project is nearly finished, but the project as a whole is being held up by Hungary's reluctance to finish its section. As a result of pressure from environmental protection groups, work on the Hungarian part of the project was halted in August 1989, eleven years after construction began. "The construction on the Czechoslovak bank of the Danube has damaged about 40 square km of land, and much of that is irreparable. A on-going problem is erosion of the Danube riverbed, and, in connection with this, a drop of the underground water level and a fall in water quality", Carnogursky said. He said Czechoslovakia must finish its part of the project, even if this means going ahead without Hungarian cooperation. He also expressed support for a plan to build dikes near the Hungarian village of Dunakiliti. Hungary has opposed this solution to the unfinished project.

REGIONAL AFFAIRS

Caribbean Countries Pin Hopes for Assistance on Rio-92 Conference*FL1801185792 Bridgetown CANA in English
1642 GMT 18 Jan 92*

[Text] Georgetown, Guyana, Jan 18 (CANA)—Caribbean Community member countries have a keen interest in a United Nations conference on the environment and development to be held in Brazil June 1-12, Byron Blake, director of the Economic and Industry Division at the Georgetown-based Caricom Secretariat, indicated. He told journalists Friday that Caribbean states, including small islands and low-lying coastal territories, are in extreme danger of global climactic changes such as rising sea levels and increased intensity of hurricanes and tropical storms.

Blake, who is also responsible for environmental matters, said the region expects a global statement on the managing of the environment into the 21st century coming out of the Brazil conference.

"We must ensure that the performance coming out of the conference takes care of Caribbean interests," Blake said. The Caribbean, he said, does not have specific information on sea level rises. "That is one of the areas, in fact, where we are saying we need some important assistance to be able to monitor what is happening over a period of time so that 10-15 years from now, we will be able to say this...The type of change which has been taking place.

"We know, however, that we have been having some more intense tropical systems...Our hurricanes have been getting more intense," he said.

Blake said there were "certain" local aspects of environmental degradation which needed to be addressed. He told reporters, however, that climate changes and sea level rises were global phenomena caused mainly in the developed and industrialised countries.

"We have to guard against this. We have to protect against the outcome of that kind of activity," he asserted.

ARGENTINA

New Law Prohibits Entrance of Toxic Wastes*PY1901212892 Buenos Aires BUENOS AIRES
HERALD in English 18 Jan 92 p 11*

[Excerpt] (DYN-NA)—The government enacted yesterday Law 24051 over Dangerous Wastes which prohibits the entrance of such materials into Argentina and sets for offenders stiff economic penalties and jail sentences reaching a maximum of 25 years.

Likewise, the measure requires the government to inform the people about the production, control, transport, handling and final dumping of toxic wastes.

At the same time, the executive power enacted Law 24059 of Internal Security yesterday, which establishes the judicial means, mechanisms and functions, for guaranteeing the

"total enforcement" of the Constitution. The law also provides for the creation of a bicameral financial commission.

The norm also empowers the Armed Forces to intervene only in "exceptional cases" as defined by the President.

The law, which Congress passed on December 18, 1991, was put into force with all of its 45 articles that were published in the Official Bulletin on the mentioned date of passage.

Regarding the law prohibiting the dumping of toxic wastes in Argentina, which both Houses passed on December 17 last year, the measure actually went into effect on January 8, 1992, but starting yesterday, it began a 90-day period of gradual enforcement.

Like the Internal Security Law, it was published in the Official Bulletin on the day of passage along with its 68 articles and two additional clauses. [passage omitted]

BRAZIL

Foreign Minister Rezek Discusses Eco-92 Agenda, Goals*PY2001232492 Rio de Janeiro O GLOBO in Portuguese
18 Jan 92 p 23*

[Interview with Brazilian Foreign Minister Francisco Rezek by Monica Medeiros; place and date not given]

[Text] [Medeiros] *What are the government's expectations regarding the UN Conference on Environment and Development [Eco-92]?*

[Rezek] There will be no changes regarding general theories or our aspirations. Everything is centered on a very simple issue: It is necessary to achieve a satisfactory economic development pattern for many human beings who live in appalling conditions. But this must be achieved without destroying the environment, because it is the patrimony of these communities.

[Medeiros] *What is the central issue of these negotiations?*

[Rezek] It certainly will be the cost of sustained development. Poor communities must achieve a dignified life pattern. They need money and technology to do this.

[Medeiros] *What is sustained development?*

[Rezek] This mysterious formula means to guarantee for these people more dignified earnings than those obtained through predatory practices. This must be achieved without destroying nature and, consequently, without making the communities pay the price because, in the end, it is their patrimony that is being destroyed.

[Medeiros] *Does the government trust that it will obtain resources to promote sustained development even though rich countries withdrew their financial support from the Pilot Program for the Amazon?*

[Rezek] Undoubtedly. The Group of Seven members cannot refuse to participate in such programs any longer. Some countries have decided to wait or have postponed their

decision to participate, but they will not state that the project should not be financed.

[Medeiros] *Why?*

[Rezek] Because the pilot program is a sample of what we hope to achieve on a greater scale in Eco-92.

[Medeiros] *Will the pilot program be used as a means to pressure rich countries to help poor countries?*

[Rezek] But of course. The program soon will be submitted to Eco-92. At this time, it is expected that after some soul-searching, those countries that can assume greater cost responsibilities, but that were doubtful at first, will change their minds.

[Medeiros] *In practice, what does Brazil hope to achieve from Eco-92?*

[Rezek] For us, Agenda 21 is the most important document. It encompasses a large development program for the next century that includes technology transfers and the financing of programs. We will strive to establish our theory of technology transference based on privileges rather than on market rules. It is unacceptable for a country that possesses the technology to diminish the damage to the environment caused by development to seek to make a profit from that technology.

[Medeiros] *But in many cases, it is not the government that possesses this technology but private companies.*

[Rezek] We do not expect a company to distribute its patent gratuitously. What we expect is for the governments of those countries where these companies are located to finance part of the costs of a subsidized transference. It is a theory that must be included in Agenda 21, and there are many countries supporting Brazil's position.

[Medeiros] *Which countries are Brazil's allies?*

[Rezek] The great supporter of Brazilian theories is Germany, which holds a prestigious position among rich countries. There is also Norway, Canada—which is cooperating in sustained development programs in Acre, and many more.

[Medeiros] *Which countries are opposed to the Brazilian theories?*

[Rezek] There is much talk about Japan. But I do not believe it can oppose the more valid theories. We believe the United States and the United Kingdom will change their views during the conference, where common sense will prevail. Brazil believes that President George Bush's presence at the conference is one of the most evident signs that we will be able to find common points of view.

CHILE

Armed Forces To Contribute to Chile's Proposal for Rio-92 Conference

PY1501221192 Santiago Radio Chilena Network
in Spanish 1000 GMT 15 Jan 92

[Text] Defense Minister Patricio Rojas presided over a meeting of representatives of the Armed Forces, police,

universities, and decontamination organizations to begin elaborating a proposal that will be presented at the UN World Conference on the Environment [Eco-92].

Chile must present an ecological proposal, like all nations attending the ecological meeting in Rio de Janeiro later this year. The national delegation will be presided over by President Patricio Aylwin who will carry with him the results of a scientific-technical debate. Minister Rojas was asked how the Armed Forces and police can participate and support the program:

[Begin recording] There are broad areas where the Defense Ministry in various ways prevents the destruction of the environment and helps to decontaminate, preserve, and to keep clean the air, land, and sea. [end recording]

The minister said that issues on meteorology, oceans, lakes, and the Antarctic, among others, concern to the Armed Forces and police.

He added that different sectors of Chileans will debate and discuss the proposal, particularly young people. The Armed Forces work on the issue will be analyzed before taking it to the world conference.

VENEZUELA

Plan To Protect National Park Lacks Funding

92WN0199A Caracas EL DIARIO DE CARACAS
in Spanish 2 Dec 91 p 14

[Article by Ross Mary Gonzatti]

[Text] Of the nearly 82,000 hectares covered by the national park, 2,000 have been invaded at various points in the park. Not only do the settlements established in this area constitute both a social and an environmental problem, but so do the facilities (freeway, highway, oil pipelines, and electric power lines) comprising the strategic Tacagua corridor.

Within three years there may be effective results associated with the recovery and protection of the El Avila National Park, if the advisory council appointed for this task has available the economic resources required for carrying out its plans.

El Avila was decreed a national park in 1958, with an area which, at that time, covered 62,000 hectares. In 1974 an additional 19,500 hectares were annexed to it, making a current total of 81,800 hectares under a protective system.

Nevertheless, 2,000 hectares of that vast area have virtually been seized, which not only endangers the environment, but also the lives of large numbers of people illegally inhabiting the park.

For years the necessity for protecting El Avila has been debated. Plans have been made and action has been initiated, such as the construction of a "supervised highway," intended to stop the invasion. However, it is only now that the projects appear to be finally materializing.

A year ago, by decree, the "Advisory Council for the Administration of the Environmental Protection and

Recovery Areas Within El Avila National Park" was created. Nevertheless, it was not until June of this year that the trusteeship was consolidated as such and began operating.

Carmelita Rodriguez de Brandt chairs this council. Accompanied by the park recovery project manager, Mariela Stolk, she maintains that El Avila "is the only park in the world that has been subjected to urban aggression on all sides. It has been invaded and degraded."

To support her assertions, she explains that 25 percent of the country's total population (that concentrated in the metropolitan area) is exerting pressure on the national park. And it is estimated that approximately 100,000 persons are living within the area under protection.

Both women explain: "The problem is that the park is located on the boundary of urban areas with high population densities and a high degree of demographic growth."

To the west, the park extends as far as the back of the Maiquetia International Airport. To the east, it extends almost to Higuerote. In the north, there are the central coast towns; and Caracas is situated south of El Avila. Beyond are the towns of Guarenas and Guatire.

This pressure being exerted on the park is not El Avila's only problem. Within the area considered a national park are the Caracas-La Guaira freeway, the old highway, and the oil pipeline supplying Caracas with hydrocarbons, which lacks the protective zone that it should have. There are INOS [National Institute of Sanitation Works] pipes, gas pipelines that would also require a protective zone, high voltage electric power lines, and a stream, the Tacagua, which, according to the soils and waters law, should have its own protective zone because it carries water year-round.

This zone of the park, the so-called Tacagua strategic corridor, has been categorized as one of the two critical points. Owing to the instability of the soils and the absence of required protective areas, the people living in that zone "are in a constant state of danger."

A geotechnical study made by the Ministry of Energy and Mines in 1989 establishes the fact that this area "is totally deteriorated and is moving from a risk situation to one of high risk."

The dangers include the possibility of landslides and the stream's rise, which could cause floods, with dwellings washed away.

According to Rodriguez and Stolk, "This is one of the most troubled zones, because of the social factor involved, since a large number of people have settled in this area. It is also troubled from a strategic standpoint, because the entire Caracas-Coastal conglomerate depends on systems located in this corridor."

Although the terrain in this zone was not so unstable, the erratic growth caused its deterioration. Compounding this was the washout of the soil through the stream's action.

The officials estimate that some 2,900 dwellings have been built in this zone, and have virtually invaded the park over the past 30 years.

The trigger of the park's invasion along the Tacagua corridor was the Ojo de Agua sanitary landfill, now closed. Proof of this assertion is the fact that aerial photos taken in 1958 show that there were virtually no dwellings in that El Avila zone then. After that year the process of a proliferation of farms, houses, and even buildings began around the old landfill.

The other critical point consists of the park's northern slope. Rodriguez explains: "There is an aggressive process of invasion directed toward the park, because the coast is a very narrow strip with little area for expansion."

The serious aspect is not merely that large contingents of people are becoming settled inside the park, but also that they are being given the facilities for their settlement through the provision of services and construction materials.

The most significant invasions are cited as those appearing in the Tanaguarena, Macuto, and Punta Tigrillo zone.

The diagnosis shows that, according to the census figures, a total of approximately 17,000 dwellings have been established in marginal areas within the national park.

The parish with the largest population living in El Avila is Sucre (42 percent of the population living in the park is located within this parish). It is followed by Maiquetia, with 20 percent. And the one that is most invading the protected areas at present is Caraballeda.

La Pastora, Catia La Mar, La Guaira, and Macuto have played a part in this aggression as well.

Four Park Saving Projects

The advisory council devised four projects with the goal of beginning their execution next year:

- Park surveillance and control.
- Definition of occupied areas and those that should be evacuated for security reasons.
- Treatment of communities in unstable and dangerous areas.
- Educational project.

To carry out these projects, first, a study will be made of the districts that are in a dangerous situation. Once they have been determined, contact will be made with the communities residing in them, to offer them what Rodriguez describes as "decent alternatives, through the facilities available to the state: the housing policy, Inavi [National Housing Institute], and Fondur [National Urban Development Fund]."

She hastens to explain that the intention is not to evict all those living within the park area, but only those who are jeopardizing the park and the facilities located within it.

In other areas not considered dangerous, the action taken will be to involve the communities living there in the environmental cleanup projects, and "convert them into caretakers and guardians of the park."

Education is the fundamental tool for this project. Inparques [National Parks Institute] and other agencies,

possibly the organized communities, and even private investors will have a role to play in these plans. Their end goal is to train forest rangers within the community itself.

Remaining for the future is the idea of establishing a physical component to serve as a boundary marker for the park: an idea similar to that of the "supervised highway," but more viable. For example, it might be a fireguard area. In Rodriguez's opinion, it would have easy maintenance, would not deteriorate the environment, and would serve as a protective belt.

All these activities, aimed at preventing the continued deterioration of the environment, and ending the pollution of waterways, the loss of vegetation, and the degradation of soils, will be possible only if the advisory council is given financial support to carry out the projects.

The council includes representatives from the Ministries of Interior, Defense, Transport and Communications, Environment, and Energy and Mines, as well as the Federal District government and the town halls of Libertador and Vargas. Nevertheless, up until now it has been operating "amid major economic difficulties and limitations."

According to preliminary figures, the recovery of El Avila will cost about \$1.2 billion. It is estimated that half of this amount could be obtained through credit from some multi-lateral agency. However, no application has been submitted to date.

Rodriguez and Stolk admit: "Saving the park is expensive and difficult." They express hope that, this time, when there is an organization ready to achieve such salvation, inertia will not convert this project into just another proposal left on paper.

Congress Approves Environmental Law

Emphasizes Damage Prevention

92WN0200A Caracas EL DIARIO DE CARACAS
in Spanish 3 Dec 91 pp 28-29

[Article by Orlando Utrera]

[Text] On 21 November 1990, the Chamber of Deputies approved the Environmental Crimes Law, following first discussion, and sent it to the Senate, where after a year, it won approval and was returned to the deputies. Thus began the second discussion of a draft which originated in 1977, and which since that time has undergone multiple changes.

The discussion by the deputies will have to do with the amendments made by the Senate, and after its passage following second discussion, it will have to be submitted for consideration to a bicameral session for final approval. This would have to be done in the few sessions remaining in 1991.

The ecology movements which have watched the deterioration of the environment in our country with great concern, noting the absence of any way of penalizing the individuals who for various reasons commit crimes against nature, are waiting for the Congress to act. The principal crimes in this category are the contamination of water, air, and animal

life; clandestine deforestation; destruction of the soil; and the dumping of toxic wastes, among others.

Aspects of the Law

The current draft of the Environmental Crimes Law is the product of various years of effort to protect the ecological system from the impact of the industrial revolution on the environment and its consequences in the life of man. This phenomenon has been characterized by the development of major scientific-technical processes to the benefit of mankind, but these processes have also given rise to the complex of ecological problems.

The proposal defines ecological crimes and establishes the criminal jurisdictions and court levels for the punishment of these crimes. It gives the police bodies, the FAC [Armed Forces of National Cooperation], and the Navy the authority to initiate proceedings when they learn of a crime of an ecological nature on our national territory. The draft also authorizes the governors to create special environmental police forces as the need arises.

The draft law is more preventive than punitive, and on the basis of fines, restitution of losses caused, and imprisonment, it defines the penalties applicable to those guilty of the destruction of nature. Of the 104 articles in the draft, more than two-thirds are preventive measures designed to forestall the pollution and depredation of the environment.

Chapter I of the draft prohibits all activities which might damage the water, such as the dumping or discharge of chemical or biological substances or agents, untreated sewage water, or objects or garbage of any sort in rivers, channels, basins, aquifers, lakes, lagoons, or water supply systems.

Land, Sea, and Air

Chapter II also provides penalties for the deterioration, poisoning, pollution, and other actions which may cause damage to the marine environment. Penalties are provided for such pollution as might be caused by projects or installations located on the nation's beaches.

Chapter III of the draft Environmental Crimes Law sets forth penalties for the degradation, sterilization, erosion, pollution, or any other action capable of doing damage to the soil. There are also penalties applicable to anyone who dumps, discharges, deposits, or abandons biological or chemical agents, unwanted objects or any other substance capable of deteriorating, sterilizing, or contaminating the soil.

In this connection, the draft also describes the penalties for the improper use of toxic substances in the course of mining operations, as well as the introduction into the national territory, without the permission of the authorities, of those types of waste classified as toxic or dangerous.

Chapter IV deals with poisoning, pollution, and other actions capable of altering the atmosphere. In this connection, it sets forth penalties for allowing the escape of gases, biological or chemical agents, or agents of any other nature, in quantities and under conditions capable of poisoning, degrading, or polluting the atmosphere.

It also defines as a crime the emission of ionizing radiation which can endanger public health, as well as providing penalties for enterprises which violate the international conventions pertaining to protection of the planet's ozone layer.

Flora, Fauna, and Noise

Chapter V deals with the protection of, and penalties for those who cause damage to, flora and fauna. The penalty for those who cause fires; the propagation of fire due to carelessness in forests, woods, or any other form of natural vegetation; or who fail to assist in the extinguishing of forest fires is imprisonment.

This chapter also sets forth penalties for those who illegally cut forest vegetation or cause its removal.

Chapter VI deals with protection of the natural landscape and the urban environment. It provides penalties for those who cause harmful changes or modifications to the topography and those who cause damage in urban centers, parks, springs, green areas, footpaths, sports areas, and the like.

Penalties are provided for individuals responsible for noise which, because of its intensity, frequency, or duration, is capable of causing damage to or disturbing human beings.

The areas under the special administration system include forest reserves, protected zones, national parks, wooded areas, natural monuments, wildlife refuges and reserves, water reserves, areas for special farm use, critical areas with treatment priority, and rural areas designated for integral development.

Complements 1976 Law

92WN0200B Caracas *EL DIARIO DE CARACAS*
in Spanish 6 Dec 91 p 28

[Text] The Chamber of Deputies has accepted the changes made by the Senate in the text of the Environmental Crimes Law without objection, so that it has finally been approved. This completes the juridical framework pertaining to the environment in Venezuela.

After many years of discussion, the National Congress has approved the Environmental Crimes Law, which is unique in Latin America. This was announced by the president of

the Environmental Commission of the Chamber of Deputies, Ramon Martinez, in the presence of the other members, Oscar Celli, Pedro Escarra, Edgar Gomez Guillen, Gabriel Nino, and Alejandro Sanchez Cortez.

It should be noted that the draft Environmental Crimes Law was approved in the lower chamber after the Senate had made the pertinent changes. It then went back to the deputies, who approved it unanimously.

The president of the Commission, for his part, made it clear that this law is the product of an effort made by various sectors of society, all of which contributed more than a few recommendations for the legal text.

He also said that the law in question is a part of a national plan for cleaning up the environment over the next 25 years.

The members of the Commission, for their part, further commented that this law must not remain a dead letter, and that therefore, a subject dealing with the environment should be incorporated in the Venezuelan educational curriculum.

In conclusion, the members noted that it falls to the national executive branch to order the implementation of the law and to promulgate the corresponding regulations.

A Victory Achieved

The importance of the new law was also emphasized by one of its main sponsors, Alexander Luzardo, who proposed the draft as a member of the parliamentary body during the period between 1984 and 1989. In the course of those five years, he served as an adviser to the commissions which were studying the legislative proposal.

Luzardo said that the approval of this law has put Venezuela in the vanguard with regard to environmental legislation in Latin America, since it serves to complement the juridical framework which was initiated in 1976 with the approval of the Organic Law on the Environment.

He stressed that the approval of the law represents a triumph for the Venezuelan ecology movement, which has been a leader in the activities designed to move this legal text forward. This movement has organized three marches to the doors of the congressional premises in the past two years.

EGYPT

Water Pollution Issues Highlighted

92WN0218A London AL-MAJALLAH in Arabic
3 Dec 91 pp 75-76

[Article: "Egypt: No Water Problem, but Pollution Problem"]

[Text] There are no people dying of thirst in Egypt or emigrating in search of water. Consequently, the problem, where it exists, is not lack of water but water quality. This is how Engineer Majdi Zaki, director of the UNICEF office in Cairo, sums up the issue.

Details of the issue are made clear by statistics of the Central Public Conscription and Statistics Agency, the Egyptian Ministry of Health, and international organizations. These statistics show that nearly 90 percent of Egypt's population lives in areas where pure—potable—water supplies are available, whereas the remaining population obtains its water from other sources which cannot, in accordance with internationally-approved standards, be considered completely potable, such as canals, the Nile River, and private wells. Pollution rates in water sources vary from place to place. The method of potable water delivery, which the government carries out, also varies.

In greater Cairo—nearly 14 percent Egypt's total population—80 percent of the population is served by individual house hook-ups, whereas the remaining 20 percent relies on public waterlines. Away from the capital, this percentage varies. The rate of individual house hook-ups in the urban centers of Egypt's provinces ranges from 40-80 percent, while amounting to just about 5 percent in the countryside.

Average per capita water consumption in the two capitals (Cairo and Alexandria) is estimated at 150-300 liters daily. In the provinces, water supplies are relatively inadequate because the resources are meager and the waterlines are old and in poor condition. In most provincial towns, we find that average daily production is estimated at 76 liters per capita, and that more than 60 percent of the population drinks from this production. Therefore, the average water volume actually delivered to consumers is less than 40 liters per capita per day.

Egypt embraces the principle of decentralism in control and supervision over drinking water supplied to the population. Cairo and Alexandria have two independent water utilities, whereas the Suez Canal Authority is in charge of water supplies for the canal cities (Port Said, Isma'iliyah, and Suez). Otherwise, water supplies are provided by local governments. In 1981, the government founded the National Drinking Water and Sanitary Sewerage Agency to draft general policies for potable water and sanitary utilities, in addition to drafting national plans and providing local governments with the necessary advice in the areas of developing and managing water supplies and sanitary sewerage systems.

According to the official statistics of the Greater Cairo Water Authority, water produced by 17 main plants is

subjected to daily laboratory tests and analyses. The outcome of these tests confirms, according to official statistics, that the impurities rate does not exceed international sanitary specifications and standards, despite the chemical and organic pollution and the bacteriological content of Nile water, as a consequence of industrial, sewage, and agricultural waste dumped into the Nile River.

Officials of the Greater Cairo water utility complain that pollution of the Nile water, as a consequence of the wastes dumped into the river, causes water treatment costs to increase by more than 10 percent per cubic meter, considering that extra quantities of chemicals and chlorine are added and that water is tested more frequently to ensure that it is free of such impurities and pollutants. Moreover, filters have to be washed continually and [filter] sand has to be replaced more often than normally needed because pollution from oil is the main reason for sand replacement.

Specialists note that human damage to the environment is an important factor in water pollution and in complicating the process of water treatment. There are three types of pollution. The first is bacteriological and viral. It causes cholera, typhoid, contagious liver inflammation, and poliomyelitis. The second is organic pollution, such as pesticides and methane compounds. The third is pollution with heavy metals, such as mercury, lead, copper, and cadmium. All are harmful to health when exceeding the set limits. It is obvious that all these pollutants are introduced by man and by his behavior toward the river. Harmful bacteria and viruses can exist in the water only through human waste. Moreover, organic materials and heavy metals increase in water only by way of industrial and agricultural wastes.

Far from Cairo—which relies on Nile river water as a potable water source—where Egypt relies on underground water, the problems are different. In some small population centers, which are far from government drinking water supply lines, people are compelled to transport water in their own way, i.e., on the backs of beasts of burden or on the heads of women, from where it is available—public taps, ordinarily—to where they live. There are also the problems of those who rely on conventional water pumps to pump out underground water as a source of drinking water. According to Dr. Majdi Zaki, director of UNICEF's clean water projects, studies have proven that more than 80 percent of these pumps produce highly polluted water, often as a result of the poor disposal of human wastes, which seep into underground water close to the surface and pollute it. This is why since 1982, UNICEF has implemented a plan to encourage the Egyptian Government and the inhabitants of these areas to adopt a new type of manual pumps, which have been tested in India and reach a depth of 50 meters, thus striking pure water unpolluted by cesspools. The experiment has actually achieved great success and the new model has begun to spread. The Arab Manufacturing Authority has agreed to produce this pump locally. All that remains is the need for an organized awareness campaign that seeks to encourage replacement of the "polluted" old pumps by advanced pumps that ensure a supply of pure drinking water.

The importance of health education becomes obvious when considering another angle of the potable water problem, to which some people may pay no attention. Studies confirm that pure water at the source does not necessarily mean pure water in the glass at the consumer's lips. According to Engineer Zaki, pollution problems in the countryside develop as a result of water transportation and storage methods. In cities, water leaves the plants 100 percent pure, according to officials of the Public Drinking Water Authority, and is then exposed to pollution in the external networks or in private tanks built atop houses, because their owners do not seal them properly and neglect to clean them with chlorine periodically.

INDIA

Amended Wildlife Act Vests Power in Central Government

92WN0231A *Madras INDIAN EXPRESS in English*
23 Nov 91 p 6

[Unattributed article: "Amended Wildlife Act Vests Power in Centre"]

[Text] A total ban on hunting of wildlife, creation of a central zoo authority, search and arrest powers to wildlife officials, enhancement in fine and imprisonment for poachers, protection to wild plants and appointment of honorary wildlife wardens in each district are the highlights of the amended wildlife protection act, which received presidential assent recently.

Significantly, the central government has withdrawn all the powers presently enjoyed by the state government to formulate its own rules under the wildlife protection act. The power to declare any wild animal as vermin would now vest in the centre.

The amended act, will have far-reaching consequences and will greatly influence the management of wildlife in the country, a senior forest official told *Indian Express*.

The minimum level of imprisonment and fine in respect of offences relating to wild animals or hunting in a sanctuary or a national park has been increased from six months and Rs. 500 to one year and Rs. 5,000 and similar punishment has been provided for offences relating to alteration in the boundary of a sanctuary or a national park. The maximum level of imprisonment and fine has been increased from two years and or Rs. 2000 to three years and or Rs. 5000.

The amended act provides that no offender above 18 years of age, would be released on probation under the provisions of the probation of offenders act or section 360 of the Criminal Procedure Code, the official said.

Earlier, the state government had the powers to declare any area a game reserve and no hunting of wildlife was permitted in such a reserve except under and in accordance with a licence issued by the chief wildlife warden or the authorised officer. Besides omitting this section, references like special game, big game and small game have also been deleted from the amended act, the official said, adding that

the outcome of the ban on hunting would be in the form prohibition of trapping and trade of birds.

The newly created central zoo authority has been entrusted with the task of specifying minimum standards for housing, upkeep and veterinary care of the animals kept in the zoo, evaluating of the functioning of zoos, recognising or derecognising zoos, identifying endangered species for the purpose of captive breeding and assigning responsibility, coordinating training of zoo personnel in India and abroad and providing technical and other assistance to zoos for their proper management and development on scientific lines. Disturbing and unauthorised feeding of wild animals in a zoo would be treated as offence.

The centre has also cancelled the licences required for trade in peacock feathers and articles made therefrom, and all trade in ivory has been prohibited.

The official said the chief wildlife warden has been empowered to take measures for immunisation of all livestock residing in or within five km. of any sanctuary or a national park against communicable diseases.

Under section 54 and 55 of the old act, only the chief wildlife warden or an official authorised by him was empowered to file a complaint in the court of law for violation of the provisions of the act and to compound such offences. The amended act, gives similar powers to central government official and also to private individuals to initiate prosecution, after giving 60 days notice.

The centre has made it obligatory for the state governments for compulsory representation of tribals on the state wildlife advisory boards to ensure that tribal interests are not affected.

Environment Minister Details Country's Unchecked Toxic Waste Dumping

92WN0229A *Bombay THE TIMES OF INDIA*
in English 6 Dec 91 p 9

[Unattributed article: "Toxic Waste Dumping Unchecked"]

[Text] Pune, December 5—Hundreds of manufacturers are poisoning the soil and water every day by dumping all kinds of hazardous wastes unchecked by law. The Union minister of state for environment, Mr. Kamal Nath, declared in Bombay recently that the Indian chemical industry alone dumps some 5,00,000 [as published] tonnes of hazardous wastes every year.

The chemical industry (including petrochemical units, refineries, fertilizer units and drug manufacturers) is certainly the single largest producer of toxic wastes, but not the only sector that merits regulatory action.

Virtually every major industry group produces a range of recognised toxic materials. A highly informative book prepared by Thermax here lists 30 major toxic wastes produced by the textile industry, plastic and synthetic material manufacturers, metal units, explosive and machinery manufacturers and electroplaters.

Even the seemingly "environment friendly" electronics industry produces hazardous wastes, including halogenated solvents, used for cleaning and drying and nonhalogenated solvents from the waste streams of machine and coating operations.

A U.S. agency has identified around 35,000 chemicals as "potentially hazardous", the broad criteria for such identification being flammability (when the flash point of the waste is 37 deg C or lower) corrosiveness (including corrosiveness to human tissue), reactivity (referring to a sharp rise in pressure or temperature as a result of uncontrolled release of toxic compounds in the environment) and toxicity.

The last is the most important criterion not only because toxic wastes can also lead to immediate or long term damage to the human body in the form of cancer and genetic mutations but also because toxicity is often a "silent killer" affecting the bio-system without raising any alarm.

The pesticide industry is easily the most dangerous source of toxic wastes as "the effluent will always be more toxic than the product." Of the major pesticides produced here, the one that should cause most concern, experts say, is monocrotophos (MCP), a "third generation" product, introduced indigenously after Benzene Hexachloride (known popularly as BHC), is banned in the US but still produced here, and malathion.

While around a dozen large producers like NOCIL and Rallis India have production capacities ranging from 500 TPD to 2000 TPD, there are also several small and medium scale manufacturers of MCP.

Typically, MCP units produce liquid wastes containing Toluene as a solvent and by-products with Chlorine and Phosphorous compounds. The gaseous wastes contain toxic substances like Methyl Chloride and Ethylene Dichloride. These wastes are universally recognised as potent pesticides and, in higher concentrations, exposure to them could be fatal. Even small dosages can lead to vomiting and nausea.

Exposure to Toluene has a frightening list of symptoms: skin inflammation, Bronchitis and pneumonia; Anorexia, Nausea, incoordination, partial paralysis, corneal burns and "polisher's keratitis" (fine vacuolar lesions of the cornea).

While waste management practices, including its physical treatment are well known, the commonest method followed in India is dumping, either in a pond in the company premises, or burial in cans or dumping in water or land.

Sometimes, waste is also burnt in the open, a highly harmful practice as there is no control on either combustion or the products of combustion [sentence as published]. The side-effects of dumping are harmful, the latest reported case being the devastation caused in the Jeedimetla and Patancheru industrial estates near Hyderabad.

A health survey carried out in Patancheru in 1989 showed that in a sample of 942 persons examined in four villages in the area, 196 had respiratory diseases, 115 had digestive disorders and 111 suffered from skin diseases.

At least 900 persons in the Jeedimetla area are reported to have been hospitalised for pollution-related ailments and around 5,000 acres of fertile land is reported to have turned barren [as published].

In spite of such alarming incidents, the corporate sector's lethargy to scientific waste management remains largely unshaken. Even in the Thane-Belapur region close to Bombay, a major corridor for the production of toxic substances in the country, industries are dragging their feet in spite of a generous World Bank loan for waste management.

Around four years back, the 83 polluting units in this corridor mooted a community incinerator, to be shared by all of them. Land was acquired from the MIDC for this purpose and the World Bank agreed to provide a loan of Rs 90 crores for the project. Four years after the idea was first mooted, the community incinerator is far from becoming a reality. The last that was heard on the subject was that the BARC [Bhabha Atomic Research Center] had been asked to analyse the waste produced by the 83 units, a basic prerequisite for the design of an all-purpose incinerator.

The BARC's report was expected to be submitted by the third week of September this year but Thermax, with whom the Thane-Belapur Industries Association has negotiated for the incinerator, says it has so far received nothing.

Government Intensifies Antipollution Steps

92WN0230A Bombay THE TIMES OF INDIA
in English 6 Dec 91 p 9

[Unattributed article: "Government Intensifies Antipollution Steps"]

[Text] New Delhi, December 5—The Central Pollution Control Board has been reconstituted to encourage, develop and apply the best practicable solutions for the prevention of pollution on water, air and soil.

The project director of the Ganga Project Directorate has been appointed chairman of the board, until a regular selection is made.

The new board includes directors of national institute who would provide the necessary inputs to the board to look at the effects of pollution.

The government has now nominated the director, Industrial Toxicology Research Centre, Lucknow; director, All-India Institute of Medical Sciences, New Delhi; scientists from the Indian Institute of Technology and Department of Scientific and Industrial Research, New Delhi.

The interests of the small-scale sector are also being represented in the board.

An officials press note stated that the government, committed to preventing further deterioration of the environment, is finalising a policy statement for abatement of pollution.

A strategy identifying priority actions has also been determined in consultation with state governments. The government will focus its attention primarily on the prevention of pollution through adoption of clean technologies. The state

governments had agreed to prepare time-bound action programmes for abatement of pollution from existing units, it was stated.

This has been done following the national conference of all state pollution control boards convened by Mr. Kamal Nath, minister of state for environment and forests, to discuss the new thrust on pollution control.

A Rs 850-crore World Bank project on industrial pollution control is being implemented. Selected state pollution control boards are to be strengthened, common effluent treatment facilities for clusters of small-scale industries encouraged, and loss provided to industrial units for pollution control equipment. This project also requires leadership to guide the adoption of clean technologies.

It was also pointed out that the board is the main instrument for implementation of the national strategy for abatement of pollution and, in this capacity, is required to play a major role for the prevention of pollution rather than merely regulation after the pollution has been generated.

This role being assigned to the board requires leadership to provide the technical and scientific inputs to the state pollution boards, and even to the small-scale industrial units.

Soviet Disintegration Halts Kerala Thermal Power Plant Project

BK0401080892 Delhi All India Radio Network in English 0730 GMT 4 Jan 92

[Text] In Kerala, the work of the proposed 1,210-megawatt super thermal power project of the NTPC [National Thermal Power Corporation] at Kayankulam has come to a halt. According to senior officials of the NTPC, environmental reasons and the political upheaval in the former Soviet Union which had agreed to share the cost of the project are some of the hurdles; 5 crore rupees have already been spent on preliminary work on the project.

ISRAEL

Meqorot Links Gaza Strip to National Water Carrier

TA0601113992 Jerusalem Qol Yisra'el in Hebrew 1100 GMT 6 Jan 92

[Text] The Meqorot water company has completed a new water line to supply the Gaza Strip with 20,000 cubic meters daily from the national water carrier. A Meqorot spokesman reported that until now the water supply to the southern part of the Strip depended on local drillings, but these have gradually dried up due to excessive pumping and the growth of the population. The new pipeline will supply water to the Qatif, al-Burayj, 'Abasan, and Bani Suhaylah areas.

Western Negev Preferred Site for New Nuclear Power Station

TA2101112992 Tel Aviv 'AL HAMISHMAR in Hebrew 21 Jan 92 p 1

[Report by Betzal'el 'Amiqam]

[Text] The preferred location for the construction of a nuclear power station is the area of Shivta in the western Negev, not far from the Egyptian border. This preference has put an end to previous proposals to locate Israel's nuclear power station near Nizzanim on the Coastal Plain. The construction of the station will require an estimated \$2 billion and take about 10 years.

The geological examination conclusions have recently been communicated to a special committee discussing the reactor's location. The problem arising from locating the reactor at a distance from the sea, whose water is essential for the cooling of the reactor, may be solved by the proposed exploitation of local water resources. The water will be raised under pressure to cool the reactor.

The vital need for a nuclear power station has emerged recently in view of the concern about the accumulated damage to the health of the local population from emitted coal waste.

MOROCCO

Seminar Assesses Country's Marine Water Pollution

92WN0227A Casablanca AL BAYANE in French 21 Nov 91 pp 1,3

[Article by Mustapha Labraimi: "Morocco's Marine Pollution Must Not Be Underestimated"]

[Text] "Marine Water Pollution" is the theme of SIPEM 91 [expansion not given], which opened yesterday at the Hassanania School of Public Works (EHTP) and will continue through tomorrow.

Sponsored jointly by UNESCO and COI [Intergovernmental Oceanographic Commission], the symposium was organized by EHTP and the association of the school's engineers in cooperation with national, North African, and European organizations.

The symposium is presided over by Mr. Bensalem Smili, minister of ocean fisheries.

The symposium demands the attention of Moroccan society as a whole. At stake is the state of health of our community's marine environment.

Often poorly understood, at times ravaged for its resources, the ocean is used as a dumping ground and imagined to be as capable of cleansing and regenerating itself as it is vast. (The same thinking is applied to rivers and streams, believed to "carry away" all that is put into them.)

This thinking is from a by-gone era and it must be completely changed. Modern-day Morocco must protect the quality of its environment, including the marine environment. It is not just a matter of keeping the environment clean; it is largely a question of harmonious and sustainable development.

The coastal ecosystem in our country as anywhere else is asked to meet several human demands that conflict with one another, although that is not always realized by the users. An example would be the demand for a clean beach and water

fit for swimming in an area where large amounts of waste water, generated by uncontrolled urban growth, are released into the sea.

Thus, human presence in the marine environment and use of its resources must be properly managed, in a way that recognizes the need to preserve it for the country's economic future and for the good of future generations.

Improving Knowledge of the Maritime Area

That will require greater knowledge of the maritime area of which the economic value is already known (fishing, harbors, recreational activities, materials, etc.). Its condition and the state of the physical, chemical, and biological processes that occur there will be scientifically documented. An assessment of potential resources has been made. That is the role of research, provided that the country is given a national policy in this domain to replace what we have seen thus far.

A better utilization of marine resources is achieved by disseminating information and by raising awareness of the need to protect the environment that generates them. In this manner, myths will be replaced by fact. The idea of immense quantities of marine resources far in excess of what can be tapped is much more optimistic than realistic. The sea's wealth as a food supply will remain theoretical as long as technology and socioeconomic factors fail to make it widely available to consumers. (Not everyone can match Japan's accomplishments, perhaps.)

Better knowledge of the coastal region will provide the basis for forward-looking assessments that will enable decision-makers to plan wisely for development and the exploitation of resources in this fragile ecosystem.

Waste generated by new economic activity and dwellings will be released directly or indirectly into the sea, along with inland pollutants borne by waterways and atmospheric pollution.

The contamination of beaches by the direct discharge of waste water along the seaboard, oil spills, and the accumulation of toxins throughout the food chain (from filter-feeding invertebrates to fish, birds, and humans) will in some cases have a very serious impact on the marine environment, the animals and plants that live in it, and on man and his activities.

The harmful effects of pollution exact an economic and social toll that must be kept to a minimum in an effort to achieve harmonious and sustainable development.

This means that strategies, laws, rules, and regulations must be drawn up to combat pollution.

None of that is possible without first gaining a knowledge of the types of waste, their origins, their volume, the concentration of pollutants they may contain and the location of their outlet into the sea or waterway.

Industrial activity produces wastes capable of altering the coastal environment, at oil and gas rigs and refineries, sugar

mills and distilleries, tanneries, paper pulp factories, chemical plants, breweries, canneries, mines, and in the form of thermal effluents.

The clearing of land and the expansion of agriculture can pollute the ocean (and dam reservoirs). Soil erosion, the presence of fertilizers in runoff from fields, and the misuse of pesticides adversely affect the coastal ecosystems.

Urban life produces various types of pollutants in the form of waste water and trash; it can also cause morphological changes in the coastal zones.

The ocean spans the globe and so will marine and/or atmospheric pollution: Pollutants do not stop at national borders. The dumping of waste into the ocean is still shrouded in mystery as we do not know the effects of wastes on the marine milieu, marine organisms, or humans. The tin-bearing organic compounds present in the protective coatings on ships is a source of pollution as is trash thrown from boats.

An assessment of the present state of marine waters along Morocco's coastline is therefore in order, to be followed by the establishment of standards and the definition of water quality goals.

The requirements of economic development must take the environment into account; if not, the environment itself could become a limiting factor.

Deterioration in Country's Water Quality Attributed to Erosion

*92WN0195A London AL-MAJALLAH in Arabic
21 Nov 91 p 83*

[Article by Ibrahim 'Awad: "Morocco: Erosion Causes Deterioration of Water Quality"]

[Excerpts] Several government institutes and bodies supply drinking water in Morocco. However, the ability to provide it in terms of quantity and sale for consumption is mostly undertaken by the Moroccan Office for Drinking Water. Similarly, the authority for preserving the environment comes under the Ministry of Health, as an administrative body responsible for public health in various sectors, including the water sector, and for the protection of the citizens' health, wherever a deficiency in the required standards exists.

The drinking water quality is monitored by water testing laboratories under the Moroccan Office for Drinking Water during production, storage, and distribution. Water resources for the production of drinking water are monitored and so are water processing and water desalination. Drinking water is monitored for pollution. All this is undertaken by the Ministry of Health department and the authorities concerned.

The laboratory contains sophisticated equipment for physical, chemical, bacteriological, and biological testing. It carries out analyses of organic pollutants, hydrocarbon fuels, suspended and rare elements, as well as chemical compounds and living organisms. The analyses are carried out on water samples from pumping, filtering, storing, and

distribution networks, as well as samples from water collection centers, especially surface water, in order to protect it against pollution and to determine the sources of pollution and their character in major water reservoirs.

Certain studies have shown a deterioration in water quality because of soil erosion or the disposal of domestic, industrial, and mining waste, for the quality of water differs according to seasons. When it rains, the water becomes muddy as a result of soil erosion, which brings with it pollution and refuse, just as is happening in the city of Fes, Aba Muhammad village, Khenitra (mid Atlas outskirts), and Tangier. This calls for treating the water in special filtering tanks and wells, which is a costly operation. This is in addition to pollution from sugar factories' waste and refuse, toxic heavy metals, and liquid mining refuse located in the middle of a water environment, such as lead from mines, which pollutes the river (northeastern Morocco). When the pollution danger increases, the authorities concerned are contacted in order to find solutions and take the necessary action.

The Moroccan Office for Drinking Water is launching trial programs in this field in order to determine the source of pollution and the water inlets which contain a high concentration of nitrates, especially in the water reservoirs of the districts of Mamorah (Rabat suburbs) and Berrechid (southeast Casablanca) because of several sources of pollution, such as septic tanks, underground water tanks, and water drains used in some factories.

Consequently, the cost of water processing has been reduced, and a distinguished taste of the waters of Sidi Mohammed Ben Abdallah dam (Rabat suburb) lake has been achieved. The density of water moss has been reduced by putting silvery Chinese shabbut fish in the lake. The program includes carrying out tests on mosses, crustaceans (water bugs), and fish to determine the degree of their poisoning as a result of sudden pollution. The effectiveness of water hyacinth in cleaning the water has been proven, but it causes blockage of water drainage and creates problems with the water taste and smell.

On the other hand, the canals between the city of Kenitra and Casablanca, which date back to 1934, are still usable for water transportation. They are similar to what is known as Marrakech pipes (these are underground drainage ditches in which water from parallel wells accumulates and then is brought to the surface) which go back to the year 1100. These have been cleaned. This is in addition to [Rekad] canal in the Marrakech suburbs, whose surface water is treated and purified for many purposes, except drinking.

But the quality of the water is also affected by the type of canals and pipes that become calcified, whether these are made of cement, steel, plastic, or amino cements. The Morocco Office for Drinking Water, town and village councils, and the distribution agencies are watching their aging process and repairing the worn-out parts that cause leakage. Additionally, the effectiveness of these utilities is being developed. The World Bank is financing several projects for

the maintenance of the old distribution networks and eliminating elements that negatively affect the quality of water. [passage omitted enumerating diseases that could result from polluted water]

The Sebou River, which casts its shadow on the city of Fes and the western districts is the most polluted Moroccan river. This calls for halting the discharge of solid and liquid waste into sewers. It also calls for substantial additional allocations and for making this one of the government's priority programs.

The future plan for insuring potable water in Morocco is distinguished by its designs for water distribution via tanks and reservoirs that will last up to the year 2030, as well as for providing the necessary protection. Furthermore, a plan is to be worked out to provide drinking water in emergencies.

SAUDI ARABIA

Medina Slated for Water Resource Improvements

92WN0196D Riyadh AL-RIYAD in Arabic 1 Dec 91 p 2

[Article by Salim al-Ahmadi]

[Text] Medina—Yesterday, Saturday, His Royal Highness Prince 'Abd-al-Majid Bin-'Abd-al-'Aziz, the administrative chief of the Medina region and the chairman of the board of directors of the Water and Sewage Agency, signed, in the office, five contracts to provide, support, and upgrade fresh water sources and services for citizens and the Merciful's guests in Medina.

During the signing of the contracts, his highness the prince said that the new projects reflect the concern of the custodian of the two holy places, King Fahd Bin-'Abd-al-'Aziz, may God protect him, with the comfort and ease of citizens and visitors in Medina. His highness emphasized the need for officials of national companies and organizations implementing [the contracts] to adhere closely to the specifications and to complete the work within the specified time.

The general director of the Water and Sewage agency, Engineer 'Abd-al-Fattah Bin-Ahmad Fu'ad, said that the costs of implementing the five contracts total close to 12.5 million Saudi riyals. He said that the first contract includes the digging of 20 wells in the al-Haql al-Thalith [Third Field] area of Medina over a 10-month period. These new wells are expected, God willing, to provide about 25,000 cubic meters [cu m] of fresh water daily. The agency recently took delivery of 24 wells that produce 35,000 cu m per day, for a total of 60,000 cu m of water produced daily by these wells. This quantity will help reinforce Medina's fresh water sources throughout the year. The cost of the new wells is 4.7 million riyals.

The second contract includes a project to install a ground-water tank with a capacity for 10,000 cu m in the city of pilgrims on al-Jami'at Road at a cost of 5 million riyals. This tank is in addition to three other tanks with a total storage capacity of 400,000 cu m, which are being implemented to serve as a strategic reserve for citizens and guests of the Merciful in Medina.

Eng. 'Abd-al-Fattah Fu'ad added that the third contract includes components for supplying water to the city of pilgrims on al-Hijrah Road by extending a feeder line to it and installing the necessary fire hydrants at a cost of 800,000 riyals. The fourth contract is for the supply a number of pumps for water wells at a cost of 1 million riyals. The fifth contract, costing 1 million riyals, is to supply several machines to improve the operating condition of several other wells and to increase the amount of water drawn from them.

The agency's general director concluded by saying that, during this pilgrimage season, the agency will see a qualitative and quantitative improvement in the services that it provides to citizens and guests of the Merciful, by means of the support and monitoring of His Highness Prince 'Abd-al-Majid Bin-'Abd-al-'Aziz and his continuous directives to upgrade the agency's services.

Riyadh Implementing Program To Control Water Table Problem

92WN0196B Riyadh AL-RIYAD in Arabic
12 Dec 91 p 6

[Interview with Yusuf al-Furayhidi, the coordinator of the High Authority for the Development of Riyadh, by Khalid al-'Uwayd; place and date not given]

[Text] The problem of the rising water table no longer causes insomnia for the residents of Riyadh, as they watch the colossal efforts being made by the government of the custodian of the two holy places, may God protect him, to ensure citizens' comfort and eliminate sources of worry or distress. The High Authority for the Development of Riyadh is the largest official agency actively engaged in controlling the problem of the rising water table in the capital. The authority is responsible for an integral project to manage and protect the environment. Through that program, it is also implementing a comprehensive program to control the water table problem. Efforts in this program are proceeding along three tracks:

- lowering the water table to safe levels,
- controlling factors that cause a rise in the water table,
- establishing protective measures to protect public utilities and buildings.

The authority structured this program based on the results of studies and precise field tests to gauge the dimensions of the problem and the damage caused by it. These studies included the following:

- Studies to determine the sources causing the problem.
- Studies to evaluate the environmental and health damage caused by the problem,
- Studies to evaluate the structural damage caused by the problem,
- Studies aimed at reducing the loss of irrigation water,
- Studies aimed at controlling drinking water consumption.

AL-RIYAD interviewed Engineer Yusuf al-Furayhidi [?], the coordinator of the authority's program to control the

problem of the rise in the water table. It queried him on the actions and measures being taken in this program. The following is the interview:

[Uwayd] Have groundwater drainage projects been carried out in Riyadh based on specific considerations?

[Al-Furayhidi] Yes, priorities for the implementation of groundwater drainage projects in Riyadh were determined based on specific considerations, including: the water table; the degree of urban development; the availability of sewage systems; and the percentage of harmful compounds in the groundwater, especially chlorine and sulphur compounds.

Based on these considerations, the city was divided into five categories, each having its own priority for the implementation of groundwater drainage systems:

- areas where the water table is less than two meters underground and where sewage systems are available
- areas where the water table is two to five meters underground, and where the groundwater contains more than 1,000 milligrams/liter of chlorine and sulphur compounds,
- areas where the water table is two to five meters underground, and where the water contains less than 1,000 milligrams/liter of chlorine and sulphur compounds,
- areas in which the water table is more than five meters underground.

Water Drainage Methods

[Uwayd] We understand from your response that the authority selects the appropriate drainage method to lower the water table in each area.

[Al-Furayhidi] The authority selects the appropriate drainage method for each area separately. It uses many methods to lower the water table, the most important being:

construction of covered and open horizontal drainage canals,

construction of vertical or horizontal wells from which water is drawn by means of pumps,

digging a group of holes distributed under the surface of the groundwater, and the drawing of water by means of a common pump,

Complex systems by which the water level is lowered using more than one of the previously mentioned methods.

Covered discharge systems, which discharge groundwater into flood drainage pipes, are being designed for use in areas of low permeability. Deep wells have been planned for areas containing thick layers of soil or rocks having high permeability. These wells will be positioned so as not affect the safety of buildings and installations. Systems have also been designed that include holes distributed in and around damaged areas containing medium-thickness layers of soil or rocks having high or medium permeability.

The collected groundwater is eliminated by being discharged into flood drainage pipes or into wadis [riverbeds]

in the city. In some cases, it can be injected into groundwater layers after being treated biologically or chemically, or discharged into lakes to evaporate naturally, or used to irrigate green areas or public parks after it is treated.

Areas Included in Authority's Plan

[Uwayd] Which areas are included in the authority's plan to control the problem of the rise of the water table?

[Al-Furayhidi] Since early 1410 Hijra [late 1989], networks have been under construction for the drainage of groundwater in a number of damaged areas in the city. Special networks have been built in most of these areas and will soon be completed in the remaining areas. We have also taken advantage of excavation works for the King Fahd Highway tunnel to extend the special groundwater drainage network in the center of the city.

Groundwater drainage networks has been completed in the following areas, each of which is indicated with the length of its network in kilometers:

Center City (1)[meaning of numeral not provided], 20.0 km; West Umm-al-Hammam(1), 2.5 km; Central al-'Urayja (1), 3.95 km; East al-[Musayyif](1), 2.36 km; [Rubwah](1), 0.95 km; Central al-[Musayyif](1), 2.47 km; West al-'Urayja(1), 6 km; Zahrah al-Badi'ah(2), 2.01 km; and Central al-'Urayja(2), 2.9 km.

Groundwater drainage networks are now being built in the following areas, each of which is indicated with the length of its network in kilometers:

Zahrah al-Badi'ah(1), 2.75 km; Zahrah al-Badi'ah(3), 5.64 km; al-Faysaliyah, 8.12 km; al-Wahah, 8.70 km; and al-[Murawwaj](1), 3.5 km.

The plan to complete projects to reduce the high water table will cover all areas damaged, or liable to be damaged, by this problem. The plan also includes the establishment of a water channel in Wadi Hanifah to carry water flowing in the wadi from its intersection with Wadi al-[Laysin] to the area south of the factories quarter. This plan will be implemented over a three-year period and will cost 345 million riyals.

Remedial Program

[Uwayd] What is the authority doing to control the sources that are causing the rise in the water table?

[Al-Furayhidi] The authority's plan to control the main sources causing the rise in the water table is based on the following:

- detection of leaks in water systems,
- control of household water consumption,
- reduction of excess irrigation water,
- completion of the sewage system in the city.

[Uwayd] What efforts has the authority made to detect leaks?

[Al-Furayhidi] Studies conducted by the authority prove that 160,000 cubic meters [cu m] is lost daily from public drinking water systems, and about 89,000 cu m is lost from water systems inside buildings. The total loss, 249,000 cu m,

amounts to 25 percent of the water brought into the city and 45 percent of the water that is causing the water table to rise.

Because this loss represents an economic loss and contributes to raising the water table, a program has been drafted in cooperation with the Water and Sewage Agency to detect and remedy leaks from these two sources. Since 1410 Hijra [1989], the agency has been implementing an intensive program to detect and remedy leaks in the drinking water networks and to pinpoint homes showing abnormal consumption and to remedy its causes. This program is being supported by the authority's consolidated budget, allocated to control and remedy the effects of the rise in the water table.

In mid-1411 Hijra [early 1991], the agency completed the first cycle of this program. Studies conducted by the authority, and a study conducted by the College of Engineering at King Sa'ud University and financed by the King 'Abd-al-'Aziz Science and Technology Campus, prove that the rate of leaks in many areas has dropped substantially, reaching less than 10 percent in some areas.

Given the importance of this program and the authority's desire to continue implementing all facets of the remedial program, this program has continued to be supported, monitored, and fully coordinated between the authority and the Water and Sewage Agency in areas where there is a groundwater problem. Priorities has been established regarding this problem.

Individual Water Consumption Is 620 Liters Per Day!

[Uwayd] Is there a plan to control water consumption?

[Al-Furayhidi] Water consumption in Riyadh at the end of 1410 Hijra [mid 1990] totalled more than 1 million cu m per day at a daily rate of 620 liters per person. Taking into account that this rate is considered high compared to other cities in the world under similar circumstances, and that high water consumption causes the water table to rise, in addition to being costly from an economic standpoint, the authority established a plan to control household water consumption in the framework of the program to remedy the high water table problem. Several regulations and instructions will be issued soon on controlling water consumption.

[Uwayd] Is there a specific plan to reduce excess irrigation water?

[Al-Furayhidi] Riyadh's green area was determined using remote-sensing techniques. Satellite and aerial photographs were taken of all of Riyadh. Information obtained from these photographs was correlated with information on land use in Riyadh available in the authority's urban information system. Riyadh's total green area is about 6,410 hectares. Of this amount, 3,674 are private farms located on the city's periphery, especially in the areas of Wadi Hanifah and Dayrab, and about 2,736 hectares are gardens and green areas inside the city. Field tests and visits were also conducted. They enabled us to ascertain the agricultural and irrigation methods in use and the amount of water actually used in irrigation.

These studies, which were conducted in 1410 Hijra [1989], indicate that 384,000 cu m of water is currently used daily in irrigation in Riyadh. Also, a calculation of the water requirements of plants in the city, which was made on the basis of

averages and scientific methods used internationally, shows that the actual daily water requirements of plants in Riyadh totals about 206,000 cu m.

The following table shows the distribution of green areas in Riyadh and the methods used to irrigate them:

Type	Area	Percentage	Irrigation System
Traffic medians, squares	112 hectares	4	Surface irrigation or inundation
Public gardens, parks	376 hectares	14	Inundation in modern gardens
Integrated projects, utilities, large housing complexes	600 hectares	22%	Spray or drip irrigation
Household gardens	1,648 hectares	60	Surface irrigation or inundation

There is no doubt that controlling private and public use of irrigation water through the use of programmed irrigation systems and supervision can save 138,000 cu m of water.

Three alternative methods have been studied for controlling irrigation water consumption. The amount of water that can be conserved by following one of these methods ranges from 45,000 to 118,000 cu m of water per day, depending on the rigor of the method.

Effects of Sewage Systems

[Uwayd] How does the presence or absence of sewage systems effect the problem of the high water table?

[Al-Furayhidi] A study conducted by the authority to determine the sources of the problem concluded that 30 percent of the city's area inside the first phase of the city's urban belt is served by the sewage system.

Studies have shown that water leaking from the sewage system and cesspools contributes 3 percent and 18 percent, respectively, of the water that is causing the problem. The installation of sewage systems does not dispense with the need to build groundwater drainage networks. The authority's study and continual field monitoring show that high groundwater also exists in areas served by the sewage system. When sewage systems are completed for currently unserved parts of the city, there will be a reduction in the amount of water feeding into groundwater and in the percentage of chemical compounds and biological elements in groundwater. This will diminish the possibility of the contamination of drinking and of water damage to the foundations and construction components of buildings. A plan is currently being drafted in cooperation with the Water and Sewage Agency for the completion of sewage systems.

UNITED ARAB EMIRATES

Abu Dhabi Municipality Initiates Agricultural, Water Projects

92WN0176A *Dubayy AL-BAYAN in Arabic* 16 Nov 91
p 4

[Text] Acting upon instructions of His Excellency Shaykh Khalifah Bin-Zayid Al Nuhayyan, Abu Dhabi crown prince and deputy commander-in-chief of the Armed Forces, to expand the green areas and to turn the desert into arable

land, the Abu Dhabi Municipality began implementing 14 new agricultural projects in Abu Dhabi and the western region.

Salim Khalifah al-Qabisi, head of the agricultural department at Abu Dhabi Municipality, said that within the framework of the municipality's plan to develop agriculture in the country in order to keep abreast with the country's cultural and construction development, the municipality initiated these projects, which are of extreme importance because of their relevance to providing services and support for the citizens. The projects aim to encourage the citizens to participate in agricultural development by establishing and equipping farms, and then handing them over to the citizens to farm them in order to increase agricultural production and to enable them to realize material returns commensurate with the work they put into their farms.

Al-Qabisi said that the projects, which are now underway, include establishing and cultivating 104 farms and planting trees on 855 hectares. They also include the installation of irrigation networks in the al-Marfa' area and building a 20-inch diameter, 40-km long asbestos water pipeline between al-[Maydur] Heights and [Ghumaysah], digging 60 wells to provide the necessary water to the area, installing a barbed wire fence on both sides of the road from al-Marfa' in Jabal al-Zannah and from [Giyathi] to al-Ruways, planting trees on 220 hectares in al-Hadwaniyah and Jabal al-Zannah, and fencing the road from Qasr 'Ajban to Dubayy road.

The projects further include wire fencing the road from al-Samhah to al-[Jaraf], tree-planting and fencing Suwayhan road, installing aluminum guard rails for road medians inside Abu Dhabi, completing the first stage of preparing and equipping the golf club, installing well desalination units in the western region and fountains in the various parks and streets in Abu Dhabi, installing electric pumps with generators in various parts of the western region, completing the planting of a 63-hectare public park in Madinat Zayid [Zayid City], and completing landscaping and cultivating the eight hectares of the gardens of Liwa'.

Al-Qabisi said that next year the municipality intends to implement 16 new projects, including the supply, installation, and maintenance of children's playground equipment in Abu Dhabi park; importing and installing 10 well desalination units in the western region, construction of two

cooled glass conservatories for the propagation and growing of house plants, drilling 860 250-foot deep wells in the citizens's farms in the west and in east of Liwa', and 112 180-foot deep wells in the citizens' farms in al-Faziyah, Madinat Zayid, and Ghiyathi. They also include installing decorative fountains in Abu Dhabi, construction and maintenance of the agricultural testing laboratory building, and the establishment of 19 vegetable marketing and delivery centers in Bani Yas and the western region.

These projects also include planting 250 hectares along the outer roads to Abu Dhabi, and 30 hectares of fruits and vegetables in Bani Yas, installing irrigation and drainage pipes in various agricultural areas, renovating the automatic irrigation networks in public parks, planting trees on 100 hectares in Baynunah, and planting 45,000 palm trees in various parts of Abu Dhabi. Other agricultural projects include planting fields and planting trees on a total of 1,200 hectares inside and outside Abu Dhabi, establishing and registering 1,000 new farms for the citizens, and providing extension services to these farms and older farms, in addition to offering veterinary services.

The head of the agricultural department added that, during the current year, the municipality completed about 14 projects, including establishing and planting five public parks over an area of 421,000 square meters, which would bring the total number of public parks to 24, an increase of five parks over last year. These new parks include a park in Bani Yas with 310,000 square meters and three parks in al-Shahamah with 66,000 square meters, and a public park in al-Khatm with 45,000 square meters. These projects also include planting 600 hectares of flatland, arborization, and animal fodder and vegetable production, which would bring the total area planted to 21,127 hectares inside and outside the city of Abu Dhabi. The projects also call for providing agricultural and extension services for 4,000 farms belonging to the citizens, representing an increase of 800 farms over last year. These farms are to be distributed to the citizens in the western region and in al-Khatm.

The projects also provide veterinary services to the animal owners in the western region and in Abu Dhabi. They also include medical treatment, vaccination, disinfection, and surgical operations. The total number of medical treatment cases dealt with for the year up to October was 287,183 cases, an increase of 63,000 cases over last year.

As for providing irrigation water for arborization projects and farms for the citizens, 400 artesian wells have been drilled by the agricultural department's mechanical drilling equipment as of October 1991.

This year, the agricultural department planted bushes, trees, and various flowers at the agricultural department nurseries, a large number of which were offered for planting to agricultural areas and tree-planting projects for citizens and residents, as well as to government institutions. The number of trees supplied as of October 1991 was 800,000 trees and 15 million flower seedlings.

The department planted and propagated 90,000 indoor plant seedlings in greenhouses, of which 40,000 were sold

and distributed. More of this type of plant is being produced to meet the needs of institutes, airports, and individuals.

In the field of agricultural laboratories, the department's laboratory carried out agricultural tests and analyses of various types of samples received by the laboratory, including samples of fertilizers, soil, seeds, irrigation water, and various plants.

There were 879 of these samples as of October 1991. Some 15,000 palm trees were planted from January 1991 to October 1991. These were planted along the roads, in citizens' farms, and in various tree-planting areas. Also, a sprinkler network was installed in an area of 400 hectares in Wadi al-Rayyum [as published, perhaps Wadi Riyamah] fodder farms. Equipment and a sterilization unit have been installed in the veterinary and agricultural laboratory at the agricultural department in order to develop the laboratories and boost their efficiency.

Also, various types of children's playground equipment have been installed in public parks in Abu Dhabi, and agricultural works and irrigation and lighting systems have been installed in the chalets and gardens of the new al-Jazirah Hotel in Ghantut. Two metal water tanks of one million-gallon capacity have been built in Wadi al-Rayyum.

Salim Khalifah al-Qabisi said that, in accordance with instructions by officials to keep pace with continuing agricultural development, new types of decorative plants have been planted along the streets of the city of Abu Dhabi. These have been laid out in an attractive and beautiful geometrical arrangement, the first of its kind in the Middle East. These types consist of wooden tree branches. At the tip of each branch a bush is planted inside a small plastic pot. Some 170 of these trees have been distributed. The agricultural department in the future will plant more of these in the remaining city streets. A vehicle and a number of agricultural workers have been assigned to water these plants around the clock.

Wadi Zikt Dam Nears Completion

92WN0186A *Al-Shariqah AL-KHALIJ in Arabic*
18 Nov 91 p 5

[Article by Mahmud 'Abd-al-Karim: "Wadi Zikt Dam Construction Has Entered Final Phases, 3 Million Cubic Meters of Water To Be Impounded That Used To Drain Uselessly Into Gulf"]

[Text] The countdown has begun to the completion of Wadi Zikt dam, one of the dams that Citizen-Sultan 'Ali al-'Uways has undertaken to construct in al-Fujayrah. It is the second dam that al-'Uways is erecting in the area, with work also proceeding on Wadi al-Tawiyayn dam in the al-Tawiyayn area of al-Fujayrah.

Signs and information indicate that the building of Wadi Zikt dam has reached its final stages. The building of the main body of the dam has been completed, and work is proceeding on its subsidiary parts.

The decision to build Wadi Zikt dam at this site was subject to strict technical, economic, and social criteria. It is about

6.5 km inland from the village of Dadna, which, in turn, is about 50 km from the city of al-Fujayrah.

The dam, which will cost a total of 28.641 million Emirian dirhams, is approximately 230 m high and 21 m high, with a base 145 m wide. It will store 3 million cubic meters of water. The dam can feed an area of 23 hectares [figure as published; possibly the area of the dam's lake—FBIS].

Hundreds of farm owners throughout the area will benefit from the dam. It will also provide millions of gallons of drinking water to residents of the valley, Dadna, and nearby areas. It thus counts as one of the huge dams being erected in various areas of the country for maximum utilization of water resources. It will also have an important safety function, protecting the area's residents from the danger of flash floods, which used to rush down from high in the region's mountains on their way to draining uselessly into the sea.

Expressing their feelings about the huge project, citizens in the Wadi Zikt area said that its main benefit will be clearly visible when runoff comes down from the mountains. It will provide large amounts of water that will work to increase the country's green area.

It Will Protect Our Homes From Floods

Sa'id 'Abdallah Rashid, a Wadi Zikt resident whose home lies in the middle of the area scheduled to become the dam's lake, and who works gathering honey from the mountains, said: "The dam will be a great blessing, for the runoff used to rush down from the mountains and make its way into the valley, which would lead the water to flow uselessly into the sea. The water would go to waste; no one would benefit from it, except that it would irrigate farms on the day of the downpour."

He added: "The dam project will make the water that used to flow toward the sea stop behind the dam. It looks like a giant in relation to the mountains that surround it on both sides. Much water will thus be provided to be used year round. It can be used in times of drought and when there is no rain."

He said: "The heavy rain that used to cause flash floods has not fallen for three or four years, but we hope to God that this year's rains will be more than those of previous years."

Seventy-year-old Khamis Bin- Hammud, a Wadi Zikt elder who was born in the area, said: "The dam is a great project undertaken by a man dedicated to his country and the people of his country, one who knows the cost of losing a drop of water and also knows what the tremendously powerful runoff from the mountains means for homes and people. The dam will, therefore, be very beneficial to us all."

He said: "One year the rain fell on the valley and drowned our crops and flocks. The water entered our houses and ruined everything in them. The electricity was out for days. The water finally made its way to the sea without any benefit; instead, there was great damage that year. However,

with the building of this great project, the benefit from impounding such great amounts of water will increase, and the danger of homes collapsing and farms being inundated will decrease."

Preventing Water Waste

The elderly retiree Sulayman 'Abdallah Sulayman, who is about 70 years old, said: "The dam will stop the runoff. It will provide us with abundant drinking water that can be used for months, rather than being lost in this way."

He added: "The dam comes to protect our farms and houses. Not a year used to pass without their being hit by torrents rushing down from high in the mountains into the valley, carrying boulders that would smash everything in their path. However, with the presence of the dam that has been beautifully engineered so that the solid mountain was utilized as part of its structure, we shall no longer fear the torrents. Given the dam, they will be a blessing from God!"

Sixty-year-old Muhammad Bin-Ahmad, who owns a farm in lower Wadi Zikt, said: "I have suffered greatly from water shortage in recent years, although my farm is located at the end of a valley that was renowned for abundant water. However, several years have passed—praise God!—in which there has been little water. But God has sent us this good man, Sultan al-'Uways, to erect a dam in our area, which greatly needs water. It will protect our homes from the danger of the flash floods that used to sweep down from high in the mountains surrounding our village on every side. With their swiftly-moving heavy stones and boulders, these floods would sweep away and destroy everything in their path, including our houses, on the way to the sea, where their large amounts of water went to waste."

'Ali Bin-'Abdallah, who also has a farm in the area, said: "Years have past in which we have not seen the runoff that used to come to us every year from the mountains. We have thus lost many crops. For a long time we have stopped planting, because the market has been hurt and no longer has any commercial value worth mentioning. It became so bad that we were taking a crate of okra to Dubayy, and the merchant would take it for a dirham a crate. Is that reasonable? We pray that our rulers and this good man may be granted long lives and good health. He has not been remiss, but has built this giant dam in our valley to protect our homes and provide water for drinking and farming. We pray that God will send the valley lots of rain this year and that the dam will fill with water to compensate us for long years of drought."

Ahmad 'Uthman Mubarak, who works in the water department and supervises the water plant that supplies the residents of the valley, said: "The dam will bring benefit to the people. It will impound large amounts of water to benefit people, crops, and livestock. We suffered greatly from the flood danger that kept us sleepless every winter. With the completion of this big dam this year, we believe there will no longer be any danger of flooding, but rather great benefit."

Preparations Lag for Rio-92 Conference*92WN0197B Moscow MOSKOVSKIY**KOMSOMOLETS in Russian 10 Dec 91 p 2*

[Article by Yevgeniya Sakharova: "A Fatefully Sloppy Job"]

[Text] On 1-12 June of next year Rio de Janeiro will host the UN Conference on the Environment and Development. It appears that all the leading lights of political society will be gathering in Ostap Bender's promised land: George Bush, Francois Mitterand, John Major and many, many more. They are also expecting our representative: Mikhail Sergeyevich.

This forum could conclude with the adoption of such ground-breaking documents as a global strategy for environmental cooperation titled "Agenda for the 21st Century," a document on the basis of ecological ethics called "The Earth Charter" and framework conventions on climate, biological diversity and, perhaps, forests.

A resolution passed by the 44th Session of the UN General Assembly envisioned preparation of national reports on the environment and development by all states. That is, each country was supposed to present an accounting of the state of ecology within its territory over the past 20 years.

For the purpose of coordinating all matters connected with the Soviet Union's preparations for the 1992 Conference, a USSR Council of Ministers decree issued on 5 January 1991 created the Preparatory Committee. V. Kh. Doguzhiyev, USSR first deputy prime minister and chairman of the USSR State Committee on Emergency Situations, was appointed chairman. Following the events of August this well-known comrade retired from public life, and the committee's activities gradually ground to a halt. The crisis in the Soviet State's environmental activities came to a head in September. That was when Minister Vorontsov, USSR minister of natural resources utilization and protection, was supposed to fly to Geneva to attend the third and next-to-last session of the World Preparatory Committee, there to present to the world the USSR's national report. To them we are still the Union.

The minister arrived in Switzerland late, as did our experts: not enough hard currency for the trip could be found in time. But the report was delivered and submitted for the conference in Brazil.

There begins what is perhaps the most interesting part. The report had not been discussed by a session of the Union government. The document was prepared under the auspices of the country's Ministry of Natural Resource Utilization and Protection, but had not been made public. There was nothing particularly sinister about that: the Soviet ministers simply could not find the time to hear the version of the work submitted by Comrade Vorontsov. And so the USSR's national report, though not approved by the government, made its way to Geneva.

At the time no one even considered the possibility that the document could suddenly become classified. In essence it was the first unified Union summary of our country's

ecological situation in the past 20 years. Everything that has exploded, been discharged into the atmosphere or been dumped into seas and oceans was supposed to be honestly and truthfully reflected in the 350-page document. Chernobyl, the Urals, Chelyabinsk, Semipalatinsk, Novaya Zemlya... According to information gathered by Academician Yablokov, 16 percent of Russia's territory is in an extremely poor ecological state. For example, the radiation level in the Urals is much higher than at Chernobyl. But what was needed was documentary confirmation of those figures...

As reported to us by G. A. Zavardin, USSR deputy minister of natural resource utilization and protection, the national report is apparently doomed to remain secret. We did not succeed in getting a look at it; the minister refused, citing the lack of photocopies. "There are very few of them"—those were his exact words. And he went on to say: "The report has not yet been approved by the government." No, it has not, but nonetheless it got to Geneva, zealously avoiding both the public and the press.

Later we learned from confidential sources that the report was not finished, that many facts that should have been in it were simply missing, and that it would have to be rewritten, since all 350 pages contain nothing but description. No facts, no specifics. That is to say, the report was essentially written in haste and is simply a sloppy job. It is understandable that Ministry of Natural Resource Utilization and Protection staff are not eager to show it to journalists in its present form. But secrets will out, one way or another.

The West does not have the kinds of problems we do. If, for instance, an accident occurs at some plant in Japan, scientists sit down at a computer to determine what kind of environmental protection equipment was installed at the enterprise in question. If any essential component is missing, then the enterprise must pay fair a rather stiff fine for the ecological damage caused. We have neither the data bank nor the technologies themselves. That is somehow not uppermost in our minds...

It is ludicrous that even in this field we have sunk to the level of the third-world countries, who have no money to seriously tackle ecological concerns. When a draft "world law" to finance ecology was proposed in Geneva, the countries of the Third World flatly rejected it. The draft stated the following: those countries responsible for environmental pollution on a worldwide scale (through emissions, explosions, etc.) would be obligated to pay the world community a certain sum of money. Compensation for damages already incurred, and an "advance payment" for the future. This money would be used to create a world ecological fund, and in the event that a country suffered an ecological disaster (through no fault of its own) a portion of the fund would go toward eliminating the effects of the disaster. By the same token, a country possessing natural resources essential to preservation of the ecological balance (for example our taiga, which purified air over a substantial portion of the planet, and so on) would be paid "incentive" money.

This draft, in my opinion a very interesting one, sparked heated debates at the session in Geneva. The USSR's

position on the matter was highly ambiguous. On the one hand, it is very attractive to rake in money for the forests and rivers we have left, but on the other hand there is no guarantee that someone's criminal negligence will not result in another Ufa or Semipalatinsk. The situation with regard to environmentally sound production in our country is little better than in Papua New Guinea. It is probably time to get serious about ecological financing at the Union level and stop putting this problem on the back burner. It is time we established a unified data bank, allocated land to enterprises for the construction of clean production facilities, introduced no-waste technologies, and rebuilt those factories, plants and enterprises which are causing significant environmental harm.

One fine day the latest act of stupidity by someone could doom us all. The diagnosis would come later: "environmentally-related illness." That could be bronchial asthma, or outright poisoning, or a host of other illnesses which do not even seem so dangerous at first glance.

We would very much like to finally hear a principled stand out of the Russian leadership (since the Soviet Union did not manage to deliver its weighty judgement) with regard to the ecological crisis that exists in our country.

Continued Soviet Presence in Antarctica Questioned

92WN0194A Moscow IZVESTIYA in Russian
11 Dec 91 Union Edition p 8

[Article by I. Gritsenko: "We Are Not Leaving Antarctica"]

[Text] Will we stay in Antarctica or not! This question acquired a political hue after teletypes in foreign agencies spread a sensational announcement made by the Chilean newspaper EPOKA all over the world. The Chileans were worried that due to the disintegration of the once powerful empire, the South Pole might be left without a single representative of the former USSR. "Even in 1973, after the military came to power in Chile, our polar explorers continued their work hand in hand,"—comments EPOKA.

I went to Artur Chilingarov, deputy chairman of the liquidated Union State Committee for Hydrometeorology, for an explanation. Recently, he was appointed advisor to Ruslan Khasbulatov on issues concerning the Arctic and the Antarctic.

—This is the first I've heard about our leaving Antarctica, although this is not impossible, it could happen. The Soviet Antarctic expedition is finding it extremely difficult to secure equipment and funding. For this reason, we were forced to cut back the national research program. Last year, we closed two scientific stations, and this year we have decreased the staff by more than half. However, we intend to develop the more important studies, including the international programs. And these more than anything else are concerned with the ozone layer, the so-called "hole in the ozone". The anxiety felt by the international Antarctic community is not unjustified: literally very soon, our research vessels could be stuck,

because we cannot receive the funds that were allocated to us through the end of this year.

It is likely that the participants of the joint Soviet-American expedition "Weddell-1" will come up against this problem. This is probably the first international station to be located directly on an iceberg adrift in the sea. Weddell will be conducting a study of global atmospheric circulation and the interaction of those processes with the Earth's climate. It took three years for the idea of forming the expedition, submitted by Soviet scientists, to bear fruit. The expedition is of a noncommercial type, and is subsidized by the state. The Americans, for example, are subsidized by the U.S. National Science Foundation—a major financier of basic science. If the question of funding for the Soviet side is not resolved, we can only guess at the reaction of the American partners. How will this failure to fulfill our obligations affect us, and who can estimate the damage done to our nation's prestige in the basic sciences?

—There is no money, but we scrape by as well as we can,—says Valeriy Lukin, head of the Soviet Antarctic expedition.—We resolve problems that have to do with our cooperation with the Americans on the basis of equal contributions.

Maybe Valeriy Lukin's optimistic attitude is justified, and business at the station will proceed as usual. IZVESTIYA plans to keep its readers informed in the future about the research being conducted at "Weddell-1"...

One might wonder what use a half-starving and half-clothed country has for faraway Antarctica? "Leaving Antarctica would mean invalidating our own history, forgetting the great names of Belinsgauzen and Lazarev",—reflects Chilingarov.

An announcement for trivia lovers: a presence in Antarctica is not all that expensive to maintain at current prices for the country's budget. Nine million rubles. The salary for polar explorers working under extremely difficult conditions barely reaches a thousand...

Now in Antarctica, preparations are being made for the next polar year. Almost all of the specialists have gone there. At the Soviet stations, the tri-colored Russian flag is flown together with the red one. Evidently, this is fully in order: according to the latest information, Boris Yeltsin has been made responsible for the Russian presence in Antarctica.

CIS Protocols on Environmental Issues Signed

LD3012224991 Moscow TASS International Service
in Russian 2150 GMT 30 Dec 91

[By special TASS-BELTA correspondent]

[Text] Minsk, 30 December (TASS)—The leaders of the eleven former Soviet republics signed three protocols at the meeting of the heads of independent states in Minsk today.

The protocol on measures for eliminating the aftermath of the Chernobyl accident says:

"The governments of the Republic of Belarus, the Russian Federation, and Ukraine are required to finalize by 10 January 1992 the list of measures to be carried out in 1992

for eliminating the aftermath of the accident at the Chernobyl nuclear power plant, together with the procedures and sums for financing them, and to sign a relevant agreement.

"Humanitarian aid for eliminating the aftermath of the Chernobyl accident is to be rendered by all states of the Commonwealth."

The protocol concerning the preparation of an agreement on preserving the fish stocks in the Caspian says:

"We take cognizance of the fact that the governments of the Azerbaijani Republic, the Republic of Kazakhstan, the Russian Federation, and Turkmenistan will prepare a special agreement to preserve the fish stocks in the Caspian Sea."

The third protocol of the conference of the heads of independent states is devoted to the preparation of agreements on the problems of the Aral Sea and on the elimination of the consequences of the Spitak earthquake. It says: "It is agreed that the governments of the Republic of Kazakhstan, the Republic of Kyrgyzstan, the Russian Federation, the Republic of Tajikistan, Turkmenistan, and the Republic of Uzbekistan will prepare a special agreement on the problems of the Aral" and that the government of the Republic of Armenia will prepare a special agreement on the problems of eliminating the consequences of the earthquake in Spitak.

The leaders of the 11 commonwealth states have appended their signatures to a "protocol of the conference of the heads of states and governments of the commonwealth." This instructs the foreign ministers to "submit for the consideration of the commonwealth heads of states proposals on the name, the structure, and the sources of financing of a working group for organizational and technical preparation and holding of the Council of the Heads of States and the Council of the Heads of Governments of the commonwealth. Foreign ministers are to hold a conference on this question in Minsk no later than 10 January 1992."

Former USSR Republics To Cooperate on Nuclear Safety

92WN0208B Moscow PRAVITELSTVENNYY
VESTNIK in Russian No 47, Nov 91 (signed to press
13 Nov 91) p 10

[Article by L. Vasilyev: "When the Atom Is Indivisible"]

[Text] Having decided to abolish tens of Union ministries, the republics have nevertheless acknowledged the need to have a unifying organ in such a sphere as atomic power and industry. Of course, the current ministry will be reduced and part of its functions will be handed over to the republics, but a unified, interrepublic organ remains, ensuring the safety and development of this vital current sector. In this sense, the atom, in spite of physics, is indivisible.

Of course, the tragic date—26 April 1986—divided the history of nuclear power into two clearly expressed periods. The first was the pre-Chernobyl period, which was distinguished by the desire to build a maximal number of AES [atomic power plants] within a short period of time, achieving the greatest possible output of electrical power

with the least expenditures. The interpretation of the lessons learned from the Chernobyl catastrophe has led to a radical change in priorities. Primary among these today is safety. All the technical and organizational aspects of our work have been thoroughly and critically re-evaluated from these positions.

In 1990, a concept for the development of a new generation of atomic power plants on the basis of nuclear installations of increased safety with internal self-protection was formulated and continues to be detailed. Projects of series atomic power plants with VVER-type reactors [water-cooled water-moderated atomic energy reactors] with a capacity of 500-600 and 1,00-1,200 megawatts are currently being developed. These will comprise the basis for development of atomic energetics at the nearest stage. The organization of large-scale operations in the country for the creation of a new generation of atomic power plants with a high level of safety corresponding to the best prospective world standards is an all-state task which has vital political and socioeconomic significance. This will create the foundation for stable power supply in the next century. The resolution of this problem is largely determined by the subsequent development of the scientific-research and experimental base.

However, we must admit that, despite such prospects and measures for increasing the safety of atomic power plants, the public nevertheless has a primarily negative attitude toward atomic power. The construction of an entire series of facilities has been halted as a result of such pressure. However, we must evaluate the consequences of such decisions in a more weighted manner. After, it may turn out that in saving ourselves from a hypothetical ecological catastrophe we will find ourselves on the brink of a real power supply catastrophe.

On the wave of the post-Chernobyl antipathy toward nuclear power, work has been halted on the construction of atomic power plants with an overall capacity of 109 million kilowatts, which has led to huge wasted expenditures—4.5 billion rubles. At the same time, a number of stations are at a degree of readiness at which the completion of construction requires less funds than their mothballing. This relates to the regular power generating units at the Khmelnitskaya, Rostovskaya, Zaporozhskaya, and Balakovskaya AES, and the Gorky and Voronezh Atomic Heat Generating Plants.

A paradoxical situation has arisen. On one hand we, naturally, want our well-being to grow, so that life will become more comfortable. Yet on the other hand we are speaking out against the basis of all these benefits—against the development of energetics, and primarily atomic energetics...

Of course, we can, for example, turn to nontraditional, ecologically pure sources of energy—the sun, the wind, and the tides.

Yet here we must clearly and firmly recognize the possible scope of introduction of nontraditional energy sources in the coming decades. The reality is such that in the entire world, as well as in our country, they may long be viewed merely as an auxiliary power source.

In examining the prospects of wind power stations, we must note that in order to exclude their mutual effect only two to three "windmills" may be placed on one square kilometer, with a realized capacity of around 2.5 megawatts. For example, the Kursk AES, with all its auxiliary services, takes up 30 square kilometers. A wind-powered station of such capacity, however, would take up 1,600 square kilometers. Moreover, this entire territory would truly become a dead zone due to the oppressive infrasonic noise created by the blades of the windmills. No one would be able to live in such a region, not even the most avid proponent of wind power generation! At the same time, the power produced by a wind power station would be of very low quality. Its frequency and voltage would continuously be changing due to the inconstant wind speed. The expenditures for numerous rectifiers and transformers necessary for such low quality power would reduce the effect to a minimum.

This, of course, does not mean that we should cut back research in these spheres. A scientific stockpile is necessary for the future. If an ecologically and economically feasible solution is found, the development of solar and wind power plants could only be welcomed.

Today many people are especially convinced by references to Western experience. So, if we turn to it, at the present time we see that in 26 countries there are 114 power generating units of atomic power plants currently under construction, with an overall capacity of 112,846 megawatts, and another 59 generating units with capacity of 60,015 megawatts are being planned. Since the Chernobyl accident there have been 56 power generating units with capacity of 59,074 megawatts introduced into operation throughout the world. This includes eight generating units in the USSR, 15 in the United States, 11 in France, four in the FRG, three in Japan, three in Canada, and two each in Great Britain and Spain. Altogether in the United States, for example, there are 108 power generating units, 54 in France, and 47 in the USSR. Accordingly, the share of production of electrical power at atomic power plants in relation to the total output comprises over 70 percent in France, 45.3 percent in Sweden, 19.6 percent in the USA, and 12.6 percent in the USSR.

I might say that in the West they are taking a more demanding approach to questions of atomic power plant safety. And, of course, the development of nuclear power generation has its peculiarities in different countries. While abroad it is generally VVER and gas-cooled types of reactors which are used, in the USSR it is VVER and RBMK [high-power fuel-channel-type boiling reactors]. Primary development in the future will be implemented at atomic power plants with VVER, analogous to the reactors of other countries which are developing atomic power generation. A peculiarity of the USSR is the development of atomic heat generating plants, for which there are no foreign analogs.

We should not think, however, that it is only in our country that special developmental directions are emerging. Technical thought is struggling with the solution to the problem of power supply in many directions. For example, in Canada there are several operational atomic power plants with reactors on heavy water under pressure. This is a strictly

Canadian invention. Canada is currently experiencing great difficulties in the production or purchase of heavy water for these plants.

We must also say that there are no standards abroad which regulate the distance from atomic power plants to large population centers. For example, in the United States (state of Connecticut), the Millstown Nuclear Power Plant is located practically within 10 kilometers from New London. In Japan a large nuclear power plant is located within 20 kilometers from... Nagasaki! In our country, the requirements are more strict in this regard.

People are concerned not only by the activity of the atomic power plants but by the entire atomic industry. Here we must emphasize that in the extraction and transport of nuclear fuel and the burial of radioactive waste, the safety requirements are very stringent.

There are two dangers associated with the extraction and transport of nuclear fuel: Radioactivity, critical state, i.e., the creation of critical mass, and the triggering of a chain reaction. However, we must not forget that in transporting unenriched fuel, which cannot sustain a chain reaction of uranium-235 outside of a reactor, the danger of critical state cannot arise. Special precautionary measures are taken during the transport of enriched uranium.

The spent nuclear fuel in most cases is transported by rail in specially protected and secure containers, avoiding large population centers, under guard, and with diagnostic apparatus on a specially scheduled train. In 15 years there has not been a single case of accident with radiation consequences. We might add that in many countries abroad this fuel is not guarded.

Many people confuse spent nuclear fuel with radioactive waste. In fact, a large part of the spent fuel will be enriched a second time. Only several percent of it comprises waste. In the USSR and the countries of Eastern Europe taken together, this waste after vitrification is reduced to 140 cubic meters. In the future, by the year 2000 we will accumulate around 30,000 tons of spent fuel unloaded from reactors. Before processing it will take up a volume of no more than 3,000 cubic meters—half of a five-story building.

The search continues for optimal solutions to long-term burial of highly active waste products. We are conducting active scientific-technical cooperation with foreign countries on this matter. The basic technological processes have been developed, and the study of geological conditions and possible places of location of these radioactive remnants is currently underway.

We often have occasion to hear statements to the effect that the USSR has become a waste burial site for the countries of Eastern Europe and certain Western states.

Here we must note that nuclear materials as well as nuclear fuel are being sent abroad. The nuclear materials consist of uranium and enriched uranium. The nuclear fuel consists of heat emitting fuel elements (TVEL) which represent very complex structures which include a large number of engineering resolutions.

In selling nuclear materials abroad, the contract does not provide for burial of any radioactive wastes by the purchasing country on USSR territory, since foreign trade deals with natural uranium never provide for either the return of it or the products of its processing to the exporting country in any form.

In the construction of an atomic power plant by Soviet organizations on the territory of another country, within the framework of agreements concluded in accordance with USSR international obligations and in connection with the conditions of the nonproliferation of nuclear weapons, provision is made for the manufacture and delivery of nuclear fuel to the importing country. The spent nuclear fuel is returned to the Soviet Union for processing and subsequent application of the useful components in industry and burial of the remaining waste.

Many burning questions which worry people arise from our ignorance and lack of information. Of course, it is extremely difficult to understand the most complex questions of nuclear physics and power engineering. However, if we want to return the trust of the people to the "peaceful atom," we must perform a sort of "liquidation of radiation illiteracy." We must overcome our former excessive secrecy in the atomic field. Today information groups and regional information centers have been created at practically all the atomic power plants, and they are conducting extensive explanatory work.

Here it is the problems of language which primarily arise. People often simply do not understand the scientific terminology, and this is quite understandable. Yet at the same time it is rather paradoxical that there is still very serious public concern regarding the ruinous effects even from a very low level of radiation, while similar radiation of a high level is accepted in medicine without the slightest hesitation. Evidently, we need time for such concepts as "rads," "rem," "zivert," and similar expressions to stop evoking fear among the public and to become understood.

The creation of objective public opinion on atomic energetics is impossible without raising the level of the population's knowledge in the sphere of ecology, the technogenic effect of various types of production and radiation effect on man. We need responsible work and a well-argued position by scientists, biologists, and medical men on these questions.

Of course, the potential advantages of nuclear power may be realized only if they are accepted by society. Today it is very difficult to do this. We must admit that today atomic energetics in our country is undergoing an acute crisis. The emergence from this crisis will largely be determined by winning the public trust.

It is the right of every people to choose how they will live. Yet in this complex time, when emotions are running high, we must find the strength to hear each other out, to listen to the voice of reason, and to make a well thought-out decision. A decision which calls not for "zero" growth of energetics, but which is directed toward improving our life on a stable basis. Because no one will agree to live tomorrow as we do today.

RSFSR Presidential Decree on Nuclear Safety Oversight

92WN0197A Moscow *ROSSIYSKAYA GAZETA*
in Russian 11 Dec 91 p 2

[RSFSR Presidential Decree: "On Reorganization of State Oversight of Nuclear and Radiation Security in the RSFSR"]

[Text] In order to elevate the status of state oversight organs and also in connection with reorganization of the RSFSR Government I hereby resolve:

1. to transform the RSFSR State Committee for Oversight of Nuclear and Radiation Safety into the RSFSR Presidential State Committee for Oversight of Nuclear and Radiation Safety (RSFSR Gosatomnadzor) [Gosudarstvennyy komitet po nadzoru za yadernoy i radiatsionnoy bezopasnostyu pri Prezidente RSFSR];
2. to establish that formation of RSFSR Gosatomnadzor structures will be carried out through a transfer of ceilings on the number of personnel, expenditures for upkeep, funds and physical and technical base—including administrative buildings, office space and property belonging to USSR Gospromatomnadzor as well as to its subordinate organizations and institutions located within the territory of the RSFSR;
3. to assign supervision of RSFSR Gosatomnadzor to RSFSR Vice-President A. V. Rutskoy;
4. to appoint Yuriy Georgiyevich Vishnevskiy chairman of RSFSR Gosatomnadzor; to make the RSFSR Gosatomnadzor chairman a member of the Center for Operational Control of Reform Implementation;
5. that RSFSR Presidential Ukase No 110, issued 31 August 1991, is to be considered invalid in the section pertaining to the RSFSR State Committee for Oversight of Nuclear and Radiation Safety;
6. that the present ukase shall take effective immediately after it is signed.

B. Yeltsin, President of the RSFSR

Moscow, The Kremlin, 3 December 1991

Murmansk Oblast Suspends Unloading of Nuclear Fuel From Submarines

LD0501134692 Moscow TASS International Service
in Russian 1234 GMT 5 Jan 92

[By TASS correspondent Vasiliy Belousov]

[Text] Murmansk, 5 Jan (TASS)— As from today, operations to unload nuclear fuel from decommissioned vessels are suspended throughout Murmansk Oblast. Instructions to this effect have been issued by Yevgeniy Komarov, head of the Murmansk Oblast administration.

The administrator was forced, of necessity, to take this resolute step. It has emerged that for a long time the military have been conducting ecologically dangerous operations

near Murmansk, unloading nuclear fuel from atomic submarines without warning the civil authorities or the public. Some years ago one such operation almost resulted in an accident.

Flagrant violations of radiation safety have been detected at an enterprise where nuclear submarines belonging to the Northern Fleet are overhauled.

Krasnoyarsk, Ukraine Contend Over Nuclear Waste Storage

*LD1401233192 Moscow Teleradiokompaniya
Ostankino Television First Program Network
in Russian 2200 GMT 14 Jan 92*

[Commentary by Petr Fil—from the "Novosti" newscast]

[Text] Today the West is worried about the fact that the USSR's political collapse can result in a drain of both nuclear arms and scientists capable of developing them. It has become known that Libya has already offered jobs to several employees of the Moscow Kurchatov Institute for Nuclear Energy. Many institute specialists are keenly considering the opportunity of getting a job abroad. After all, the salary promised by the Libyan side amounts to \$2,000 a month. According to TASS, several dozen specialists from the Kurchatov Institute are already working in the United States, Japan, and other countries.

In addition, it seems that a split of the nuclear complex, which was unitary at one time, is starting. In reply to the Ukraine's refusal to supply Krasnoyarsk Kray with food and industrial goods, the Krasnoyarsk Kray Soviet informed the Ukrainian leadership that as of 15 January the kray would cease to receive waste from Ukrainian nuclear stations. South Korea immediately showed interest in the storage facilities for waste nuclear fuel situated in Krasnoyarsk, which form part of the mining chemical combine which produces weapons-grade plutonium for atomic bombs and its business circles showed readiness to pay up to \$1 million for a ton of waste fuel from Korean stations which would be accepted in Siberia. Nuclear sites in Japan and India are also being considered as prospective suppliers of nuclear waste and currency.

If, motivated by economic profits, other home storage facilities of nuclear waste start to refuse delivery of waste fuel from Commonwealth nuclear power plants, one can expect waggon-loads of unburied radioactive waste to appear roaming across the land. (Video shows archive footage of various nuclear plants, control rooms]

New Safety Equipment To Protect Rovno Nuclear Reactor

*PM1601115792 Moscow PRAVDA in Russian
15 Jan 92 p 1*

[Untitled report from PRAVDA-TASS roundup under the "Day's Pulse" rubric]

[Text] Modernization of the first reactor unit at Rovno Nuclear Electric Power Station has begun with the installation of modern apparatus to protect the reactor in accordance with technological parameters. This will make it possible to enhance the station's safety and reliability exponentially.

Novaya Zemlya Radiation Study Results Released

*LD2101044592 Moscow Radio Moscow World Service
in English 1910 GMT 20 Jan 92*

[Excerpts] It is now well over a year since the last nuclear weapons tests at the Novaya Zemlya test site in the Arctic region of Russia. With some background information on the test site and the results of radiological studies there during the past year we turn to Boris Belitskiy.

[Belitskiy] An archipelago in the Arctic seas north of Russia, Novaya Zemlya has been a nuclear testing range since 1955. A total of 132 tests have been carried out there, 87 of them in the atmosphere, three underwater, and the rest underground. [passage omitted]

At the same time the Government of Russia ordered a scientific study of the archipelago to evaluate the impact of the nuclear testing there on the environment. The scientists have just made known their preliminary findings.

To be sure, such studies of the local environment were carried out in the past too but in those years their results were immediately classified. This gave rise to a natural sense of alarm and exaggerated fear on the assumption that the authorities were concealing a (?worst case) scenario. The offspring of this marriage of secrecy and misinformation was a bad case of radio-phobia throughout northern Russia with a spill-over into Finland and the Scandinavian countries.

The latest scientific findings should set these fears to rest. The average radiation in the archipelago, in terms of both caesium and strontium contamination is but very slightly above the global background. The gamma radiation one meter above ground is likewise close to the average background. True, there are veins of higher radiation, three such zones in all. Two of them, one in the north of the archipelago and the second in the south, are due to atmospheric tests carried out before 1963. The third may be traced to an underground test in August 1987 which involved some (?venting) of radioactive gases. It was this site that a Greenpeace expedition sought to reach in 1989 following satellite-based maps. It did reach the area and confirmed that this clearly marked zone was not contaminated to such an extent as to require decontamination efforts.

Well, such, according to the latest findings, is the radiological situation in the archipelago. Clearly there is some contamination in well-marked zones but not on a scale to justify an outcry.

Will there be further nuclear weapons tests in Russia? The view taken at a conference just held in Moscow, at what is

still called the USSR Ministry of the Atomic Power Industry, is that the complete ending of tests in the absence of reciprocal steps in the West would amount to unilateral disarmament. Tests, it was stated, are needed not so much to check the state of existing warheads as to test antimissile defense systems and other defensive weapons systems. But the nuclear defense experts, it was stated, would follow the guidelines of Russia's foreign policy and would welcome international agreements to ban all nuclear tests.

USSR Air Pollution Emissions, Cleanup Costs Detailed

92WN0143A Moscow VESTNIK STATISTIKI
in Russian No 10, Oct 91 pp 64-65

[Two Tables on Pollution and Cleanup in USSR Cities]

[Text]

The Following Data Is From Press Releases of the
USSR State Committee for Statistics

Pollution of Air in the Atmosphere by Industrial Enterprises During the First Six Months of 1991

	Tons (000)	% Compared to First Six Months of 1990
Total of Harmful Substances Discharged Into Air	26,192	93
Including, from Cities Over One Million Pop.	2,578	99
Cities include:		
Alma-Ata	22	102
Volgograd	107	96
Dnepropetrovsk	126	106
Donetsk	84	98
Yerevan	23	121
Kiev	37	137
St. Petersburg	107	114
Minsk	57	117
Moscow	168	113
Novosibirsk	121	78
Omsk	220	96
Perm	78	102
Samara	64	97
Ekaterinburg	30	85
Tashkent	20	88
Ufa	130	94
Chelyabinsk	191	97

Emissions from industrial enterprises that pollute the atmosphere decreased by 2.1 million tons in comparison to the first six months of last year. At the same time, they increased by 1.5 million tons at nearly one-third of the enterprises. In addition to the cities listed, emissions of harmful substances increased at industrial sites in Archangelsk, Irkutsk, Angarsk, Zaporozhye, Makeyevka, Almalyk, and Rustavi.

Progress in Taking Measures To Decrease Emissions of Polluting Substances Into the Atmosphere in 1990

	Total Est. Costs as of Start of Measures		Decrease of Emissions from Stationary Sources of Pollution (in 000 tons)	
	Rubles (Millions)	% of Est. Costs	Actual	Incl. Amts. Due to Measures Taken
Total for Industrial Enterprises	2,471.5	77	3,363.7	2,026.3
Including cities with more than one million pop.	192.1	72	301.4	246.2
Cities include:				
Alma-Ata	8.8	75	2.7	5.2
Volgograd	6.4	90	5.6	2.3
Dnepropetrovsk	12.9	69	23.4	13.4
Donetsk	11.7	115	2.2	6.2

**Progress in Taking Measures To Decrease Emissions of Polluting Substances
Into the Atmosphere in 1990 (Continued)**

	Total Est. Costs as of Start of Measures		Decrease of Emissions from Stationary Sources of Pollution (in 000 tons)	
	Rubles (Millions)	% of Est. Costs	Actual	Incl. Amts. Due to Measures Taken
Yerevan	2.3	79	4.0	0.6
Kiev	8.6	79	7.7	4.8
St. Petersburg	33.0	83	4.4	6.8
Minsk	7.0	69	10.2	2.0
Moscow	10.3	99	17.1	12.1
Novosibirsk	3.8	54	8.7	3.2
Omsk	20.2	72	8.6	5.8
Perm	4.6	23	23.7	15.1
Samara	4.5	79	15.2	4.5
Ekaterinburg	5.2	66	3.9	4.6
Tashkent	2.3	89	8.7	3.5
Ufa	7.0	86	31.6	13.4
Chelyabinsk	4.3	33	+0.7	1.4

Due to not completing the measures proposed for safeguarding the atmosphere, the decrease in emissions of harmful substances was only 4/5 of the total expected. The actual decrease in the impact of emissions on the atmosphere was determined not only by implementing measures to safeguard the quality of the air, but also by a decrease in the extraction and processing of oil, coal, and iron ore and a decrease in the output of many types of products made by metallurgical and chemical-wood pulp industries.

Dioxins Reach 'Extremely Dangerous Levels' in USSR

92WN0194B Moscow SOVETSKAYA ROSSIYA
in Russian 13 Dec 91 p 3

[Article by N. Danilov]

[Text] If before, we imagined the apocalypse as an instantaneous act destroying life on enormous expanses in the fire of nuclear war, then now, when science has turned to face our ecological problems, it is seen as the slow and torturous process of extinction for the human race in a polluted environment that is no longer suitable for life.

The dioxin. This chemical substance can be called, with every right, a synonym for the coming ecological apocalypse. One trillionth of a gram of it causes irreversible genetic damage in humans, blocking the immune system and depriving it of all protection against any kind of external force, whether it be a virus, bacteria, radioactivity or stress. The first warning of the extraordinary danger of dioxins was heard in 1969 in the work of American scientists sharing their pacifistic ideas. They pointed out that the herbicide "Agent Orange", which was used by American military forces in Vietnam, contained a mixture of dioxins. It was this that caused genetic mutations and diseases of the liver and immune system that do not respond to any kind of medication in thousands of Vietnamese, yes, and in American servicemen who came in contact with the herbicide, as well.

Of course, the data on the genetic consequences of the use of herbicides containing dioxins that were intended for military purposes, which has miraculously filtered into the

scientific press, was not enthusiastically received by the leadership of the American military apparatus. A genuine disinformation campaign was launched against the scientists, during which for each truthful article on dioxins, tens of materials were printed that "disproved" their toxic effects. The propaganda attack on the scientists was continued through 1984, although the U.S. Administration had a sufficiently complete profile of that toxin, and although Congress had, back in 1969, held its first closed expert consultation on dioxins.

Again, in a closed session held a little later, the U.S. Congress examined questions concerning urgent ecological rehabilitation having to do with dioxin contamination in humans, agricultural areas and bodies of water. By that time the waterfall at the Great Lakes was dead due to dioxin pollution. Ecological measures taken in the United States had made it possible to decrease the dumping of substances containing dioxins into the environment by almost 100 times! According to publications in the Western press, by the mid-seventies, practically all the sources of dioxins and its concurring substances were known, and treatments had been developed for dioxin poisoning.

A curious detail: in the United States, there is an anti-stress law that is unique and so far the only one of its kind in the world. It forbids employers and managers to create stressful situations at the work place. This is because under conditions of dioxin contamination, stress leads to a sharp decrease in mental and physical capacity to work and to a drop in immune system activity. A large portion of the studies on dioxins done in the United States were kept secret from the very beginning.

The USSR has had practically no opportunity to acquire the equipment for determining the presence of dioxins in agricultural products and chemicals. The first set of devices appeared here only in 1984. The export of this apparatus fell under COCOM's [Coordinating Committee for Multilateral Export Controls] prohibitions. Whereas Finland, for example, had those opportunities. And what happened? From the results of analyses of imported produce published yearly in the open press, it appears that the Finns sometimes return up to 30 percent of their imported grain or demand that its suppliers cover expenses for its disposal! In Canada's southern provinces an enormous amount of dioxins are found in the grain, as well, but the Canadians insist that there is still less there than in grain from the United States.

I would like to examine separately the attitude of Soviet scientific organizations towards the dioxin problem. I will say first off that the warnings of progressive Western scientists have been voices crying in the wilderness. In the flood of information and disinformation on dioxins, our country could not and did not even attempt to determine the sources for the formation of this dangerous substance. In the USSR, chloric technology has not been discontinued as it has in the United States; it is becoming even more widespread.

In the USSR, 12 patent certificates have been issued on seed treatments employing industrial hexachloride. But this isn't all. Until very recently, we would buy up thousands of tons of pesticides containing admixtures of dioxin in FRG, Switzerland, Japan, France and Great Britain. In all, in the USSR widespread use of more than 80 similar preparations was permitted that are categorically forbidden in the West!

Dioxin contamination has reached extremely dangerous levels in a series of regions in our country. The cotton- and rice-growing republics suffer the most. We can already say that in certain localities the immune systems in the population have been so blocked by dioxins that no medical treatments can prevent a gradual genetic degeneration. Yes, the fact is that the situation in Moscow, itself, is not much better. The capital has indeed become one of the cities that is most polluted with dioxins. Specialists say that the level of dioxins in the breast milk of nursing mothers in Moscow constitutes a danger for newborns. It is safer to feed them artificial formula. But here we have difficulties, as well, as there is almost no place in our country that produces milk that would not contain traces of dioxin substances and DDT. Ten grams of cream contain the maximum permissible daily dose of these substances for an adult person!

Ecology Minister Terms Russian Environment 'Catastrophic'

92WN0208A Moscow ROSSIYSKAYA GAZETA
in Russian 20 Dec 91 p 1

[Article by Sergey Nikitin: "We Have Already Taken So Much From Nature..."]

[Text] At a recent meeting with journalists, RSFSR Minister of Ecology and Natural Resources Viktor Danilov-Danilyan called the ecological situation in the republic "catastrophic."

Those present were familiarized with the speech prepared for presentation at the United Nations. The authors—Doctors of Economic Sciences V. Danilov-Danilyan and Yu. Arskiy—cited the hypertrophic development of environmental-exploitative sectors of the national economy, the outdated and worn out fixed production capital, the all too common cases of violation of technological discipline by workers in agriculture and industry, and the absence of ecological awareness by the population as being the primary factors in the ecological threat to the country.

"As a result of the barbaric pollution of the atmosphere, the water sources, and the soil, the economic loss reaches 75 billion rubles [R] annually. The 'generosity' characteristic of the Russian mentality and conditioned by the geographical factor is turning into ecological irresponsibility," said V. Danilov-Danilyan. "We have it in our blood that each ruined hectare of forest, each ton of oil spilled on the ground, is not the last. By carelessly utilizing our natural resources, we are living at the expense of future generations." Moreover, few people are aware of the fact that the contribution of the ecological factor to the rate of illness in the population has already reached 40 percent.

Can we find a way out of the situation that has been created? V. Danilov-Danilyan believes that his ministry, which unites 11 formerly independent departments into a single integrated structure, is up to this task. On the territory of the republic there is an extensive network of environmental protection organs. It is necessary only to strengthen their material-technical base and to remove them from subordination to the local organs of power. The latter must be done as quickly as possible, because efforts at usurping the rights of environmental application are ever more often manifested at the local sites.

The ministry is pinning definite hopes also on aid from the Western countries, most of whom are ready to allocate money for specific projects. Specifically, in recent days talks were held with the leaders of Switzerland, which promised to donate \$600 million from its state budget for Russia's ecological needs.

And of course, we will not avoid a catastrophe if we retain the existing propensity of the natural economy to lean in the direction of raw material extraction sectors, while the technological equipment of the processing industry remains at the same level as it was at the turn of the century.

Ecological Rescue Plan Proposed for Volga Basin

92WN0143C Moscow ROSSIYSKAYA GAZETA
in Russian 22 Nov 91 p 8

[Article by Natalya Pchelina: "Will the Public Save the Volga?"]

[Text] The "Revival of the Volga" program was developed through the initiative of the Volga Ecological Parliament, a public organization whose members are deputies of the Volga Basin oblasts. Approval of the program is planned for December.

For 1991-1992, practical measures have been planned to eliminate the most dangerous pollution, as well as pollution

whose elimination will require a minimum expenditure of material resources and time. There has been a sharp decrease in the discharge of untreated sewage.

In 1993-1995, a unified system for the ecological monitoring of the Volga Basin is supposed to be established. Planning has begun for large-scale implementation of minimal-waste and no-waste technologies, closed and circulating systems for water usage, and systems for thorough purification of gas wastes.

The years 1996-2000 will mark the beginning of a practical implementation of a complex approach for resolving problems of the efficient use of natural resources. And by the year 2000, there should already be ecologically safe levels achieved for the anthropogenic impact on the natural environment.

Finally, between the years 2001 and 2005, basic conditions will be effected for an ecological balance in the interaction of man and nature in the Volga Basin.

Experts who took part in the discussions noted that this idea involves corrective but not preventive measures. One does not have the feeling that there will be a transition to a market economy, because the politicians look at a different kind of distribution of authority. Incidentally, six or seven years ago America changed to direct government regulation, having turned down indirect market relationships. Here, however, our politicians have not yet clearly determined the interrelationship with users of natural resources.

Skeptics believe that our economy will not be able to withstand a drastic reequipping of our large chemical and hundreds of other plants which are in the Volga Basin. In order to do that we would have to "reach," in an economic sense, at least the 1985 level, otherwise any plan is doomed to failure, and citizens would be faced only with increases in the costs of communal services and goods produced by industrial enterprises.

And anyway, who, given our present conditions, would provide the money for this kind of program? Basically, our hopes lie in a new mechanism for setting prices and paying taxes, including differential payments for natural resources. It has been decided to petition the RSFSR Council of Ministers to appropriate the necessary funds from their central resources for each year. It has been recommended to the leadership of the republics and oblasts located in the Volga Basin that they accept their financial share of the costs to implement this program.

Resources can be found if funds are not allocated to "destructive" branches of the economy and if Russian raw materials are not squandered. It would appear that it is necessary for public forces, together with the Soviet government, to inventory all production on the Volga.

According to members of the Volga Ecological Parliament and the public, the time has come to introduce a legislative initiative in the Russian parliament on approving a law regarding the Volga. Ultimately, someone will have to take the responsibility for the Volga's future.

Missile Troops 'Ecological' Units Formed

92UM0299A Moscow KRASNAYA ZVEZDA in Russian
1 Jan 92 p 4

[Report by Colonel V. Kharlamov: "Ecologists on the Test Ranges"]

[Text] An ecology subunit has been set up in the Strategic Rocket Forces. We describe the work of these military ecologists.

The need to create a special subunit to monitor environmental protection has been particularly felt during the course of the elimination of missiles in accordance with the Soviet-American INF Treaty.

By order of the commander in chief of Strategic Rocket Forces an ecological company has been created. Its staff is made up mainly of experts from chemical subunits who are familiar with the procedure for collecting samples of contaminated substances from the air and the soil. Special machines have been put at their disposal for chemical reconnaissance, along with radio sets and other essential equipment.

The work of the ecological company has been carried out immediately before, during, and after completion of the explosive demolition of missiles.

Before each explosive demolition the ecologists analyze the meteorological situation. Here they consider everything—wind speed and the possibility of phenomena that might pose a threat or cause amplification of the shock wave. If these data do not fall within the calculated values, the special work is canceled.

For two hours before the explosive demolition background samples are collected from the air, and even before that some 50 chemical reconnaissance vehicles and other vehicles traverse routes according to the wind direction. They disperse to carry out their work along a route 80 to 120 kilometers long. As a rule, two or three helicopters are also allocated for ecological support. Some 150 people are involved constantly in these measures.

After explosive demolition of the missiles, control readings are taken, giving due consideration to the calculated time for the arrival of the cloud. In general this work is quite laborious and requires considerable effort. Thus, on days when the explosive demolitions are taking place the ecologists have to work for 10 hours at a stretch in the field, in the wind, regardless of the heat or of the frost, depending on the time of year.

Even on regular days the experts in the company do not sit round idly. Their concerns include seasonal work, for example. In the summer they collect water, soil, and plant samples, in the winter, samples of snow, and in the fall, samples of grass, hay, silage, tomatoes, water melons and musk melons... This is all done in accordance with scientifically sound methodology, giving due consideration to the recommendations of the scientists. It is worth mentioning that together with the scientific institutions, for example, the Tayfun Scientific-Production Association and the former USSR Ministry of Health Institute of Biophysics, the

missile troops have entered into contracts to organize ecological-hygiene escorts and to monitor environmental contamination.

When talking about the work of the military ecologists, we should put in a good word for Lieutenant General N. Mazyarkin, Major General V. Tonkiye and Major General V. Astafyev, Colonel A. Palchikov, and Lieutenant Colonel V. Subbotin. They have devoted a great deal of effort and energy to this new business for the troops—ecological work.

Of course, the commander of the ecological company, Major V. Ivanyut, and his subordinates, also deserve respect. All the practical work has been laid on their shoulders. Now they have the great experience that is necessary for them in their day-to-day activity and that is useful to all other ecological subunits. And there is no doubt that there is a need to create them, and not only on the range at Kapustin Yar. They will be needed in future work to eliminate the nuclear missile arsenal.

St. Petersburg Lacks Funds To Pay for Finnish Environmental Projects

*92WN0144A Helsinki HELSINGIN SANOMAT
in Finnish 19 Nov 91 p 5*

[Article by Riitta Vainio: "St. Petersburg Short on Foreign Currency To Pay for Environmental Projects"]

[Text] Finns are wondering whether or not to accept real estate as payment.

The city of St. Petersburg has frozen its foreign currency reserves for next winter and cannot use these funds for payment on environmental projects. The chairman of the city's environmental committee, Igor Artemyev, announced the ban on payments using foreign currency Monday in Helsinki.

St. Petersburg officials have been negotiating with Finnish concerns about the construction of, among other things, a hazardous waste facility and water purification plant. Artemyev could not say whether or not the ban affects those projects presently in the planning stages.

Timo Makela, chief of the Environment Ministry's East Europe Division, said that the news about the ban on use of foreign currency was confirmation of information that had already been known. Foreign currency will be set aside to buy food next winter and there is not enough to also pay for protecting the environment. The news means that some other source of financing must be found. The economic condition of the USSR is such, however, according to Mikkola, that it will be difficult to find acceptable forms of payment.

Artemyev said that there is a plan to offer real estate, raw materials and labor as payment. Another possibility might be the leasing of land with the first rent payment due in 99 years.

The Finnish concern involved in the hazardous waste facility negotiations is Outokumpu. Olavi Urvas, manager of Outokumpu's USSR trade department, said that the actual commercial negotiations stage has not yet been

reached. The initial plan was for the Russians to pay for half of the project with foreign currency and the rest with rubles.

Hotels could be built on the real estate holdings.

Operations manager of Outokumpu Ecoenergy Inc. Terho Jaatinen figures that the foreign currency payment ban will not affect the construction of the hazardous waste facility since there are, in addition to the city, approximately 20 local enterprises involved in the project. Financing is not, therefore, totally dependent on the city.

Outokumpu could accept as payment products destined for Finnish markets or for further exportation to Europe. According to Jaatinen it is difficult to say whether real estate will be of interest or not. "Depends on what they have to offer."

Outokumpu is, for example, accepting raw materials as payment for remodeling smelters in the Kola Peninsula.

Timo Makela said that the real estate introduces a new and interesting aspect of business with the East. This makes possible the building of hotels in cities, but not without attached risks.

St. Petersburg will host an environmental conference in St. Petersburg next summer.

Both Finnish and Russian citizens' groups are preparing to hold a "Our Mutual Environment" conference in St. Petersburg next summer. Five hundred people from Russia, Finland, and the rest of Europe are expected to attend.

The purpose of the conference is, in addition to a broad ranging agenda and various displays, to inform local residents about the nature of environmental activities in a free society.

Artemyev, chairman of the St. Petersburg environmental committee, has been involved in conference preparations and said that residents of St. Petersburg, the former Leningrad, have been kept in the dark about environmental problems until now. Only after a new city council took office in March of last year has the environment and problems associated with it become a topic of discussion.

Environmental Technology Training Centers To Be Set Up in Russia, Baltics

*92WN0144D Helsinki HELSINGIN SANOMAT
in Finnish 9 Nov 91 p 9*

[Unattributed article: "Technological Centers To Be Established in the USSR and Baltics"]

[Text] Environmental issues are in the forefront in Finland's vicinity.

A network of training centers focusing on technology and various aspects of free enterprise will be established in the USSR and the republics that are seceding from it.

This project is being implemented by the IACEE, an international educational institution providing continuing education for engineers. This organization also involves some Finnish colleges. The new centers will be operated in connection with local colleges.

Thirteen centers will be operating by year's end. The centers being set up near Finland will specialize in conservation and environmental technology.

One center has already been established in St. Petersburg and the goal is to get centers in Petrozavodsk and Murmansk next spring. "We should also have similar centers in all of the Baltic countries next year," said Markku Markkula of the IACEE.

Soviets will be responsible for most of the instruction.

The Soviets will take care of most of the actual teaching. A minimum of ten million markkaa will be spent on the project for labor, equipment and instructional materials. The biggest part of the money will be obtained from private concerns and the U.S. government. The cost of the pilot phase which ends next spring is three million markkaa.

Minister of Environment Sirkka Pietikainen of the Conservative Party said that her ministry has provided 200,000 markkaa for the compilation of a report on the future prospects of this project. "The report deals with the expansion of the project and describes the ways that the utilization of internationally produced instructional materials and the establishment of training centers near Finland can result in the maximum benefit from an environmental standpoint," stressed Pietikainen.

The operation of the centers is based on telecommunications teaching, data handling techniques, and internationally prepared instructional materials. Western microcomputers and video equipment has been obtained and will continue to be obtained for the centers.

The instructional material is primarily designed for telecommunications teaching and has been developed by European and American universities. For example, the first five courses offered in St. Petersburg consisted of, among other things, mastery of modern technological products, organization of production and product quality. The courses range from four to 40 days in length.

IACEE is a worldwide cooperative educational institution with 500 members from 57 countries. The most important membership group is formed by technological colleges and their continuing education departments. The headquarters of this two-year-old institution is at the Technological Institute in Espoo's Otaniemi.

Baltic States To Cooperate on Environment

92WN0143B Riga DIENA in Russian 9 Oct 91 p 4

[Article by Iveta Tomsone: "Baltic States Will Cooperate in the Area of Environmental Protection"]

[Text] **Riga, October 7.** Baltic states, in implementing their sovereign right to the use of natural resources and in the course of their everyday activities, should not have an adverse effect on the environment of other countries. This was decided upon at a meeting held at the end of last week in Vilnius between representatives of institutions of state governments and commissions for environmental protection of the Supreme Councils of Latvia, Lithuania, and Estonia.

The representatives of the republics reached an agreement relative to the establishment of a joint complex for processing waste. Also discussed was adherence to the Basel Convention, which forbids transport and storage of waste products in Third World countries. O. Batarevskiy, chairman of the Latvian Republic's Supreme Soviet Commission for Environmental Protection, told DIENA that the attitude of the Lithuanian representatives toward this proposal was uncertain since Lithuania transports its waste to be stored in Russia. "And still, the main polluter of nature in all the Baltics is the Soviet Army," admitted O. Batarevskiy. The Estonian Minister of Environmental Protection, T. Kaasik, said that the following has been revealed: Two nuclear reactors and a uranium enrichment plant are in operation in one of the restricted military zones. It is unknown where radioactive waste has been buried. O. Batarevskiy told DIENA that in checking the radioactive surroundings, no increase in radioactivity was found in areas of Latvia where military units are stationed. It is possible that the nuclear reactors are well insulated.

He also said that the Lithuanians, whose Mazeikiai oil refinery is polluting the Latvian border area, promised to install an air monitoring system and, insofar as possible, to improve their technology. "On the one hand we are reproaching Lithuania for polluting our environment, and on the other hand we are forced to ask them for fuel." One has to consider that Lithuania and Estonia supply Latvia with power and fuel, polluting not so much the Latvian as their own territory. Thus, in Estonia there are deposits of oil-bearing shale near the eastern border, and pollution extends into Russia, but the electrical power produced gets to stay in Latvia. The conclusion was reached that Latvia, with regard to the cleanliness of the environment, is in a much more advantageous position than its neighboring republics.

"Rumors have spread at government level that the Council of Ministers of the Latvian Republic has forbidden the other republics to transport petroleum products through the port of Ventspils. There were no such orders given by me, but Lithuanians were unhappy about the prospects of that occurring," said O. Batarevskiy. The southern neighbors are willing to invest resources to put Ventspils in good repair, so that they do not have to build a terminal themselves, because they have no suitable ports for this purpose.

Problems of environmental protection can be resolved effectively only through international cooperation.

Estonia's Narva Power Plant To Get Sulfur-Removing Equipment From Finland

92WN0144C Helsinki HELSINGIN SANOMAT in Finnish 12 Nov 91 p B 9

[Unattributed report: "Ahlstrom To Provide Sulfur-Removing Apparatus to Narva"]

[Text] Ahlstrom Ecomachinery will furnish the Eesti Energy Production Group power plant in Narva with equipment for removing sulfur from smokestack emissions. Their experimental equipment will be testing the wet wash technique in a power plant that uses oil shale for fuel.

Ahlstrom will provide the know-how and the raw materials needed for the equipment as stated in the agreement. The customer's own machine shop will manufacture and install the equipment. The value of the agreement is about 20 million markkas and most of the money is coming from the Finnish environment ministry.

The gaseous emissions of the refinery with the experimental equipment correspond to about 50 megawatts of electrical capacity.

Kazakhstan, UNEP To Coordinate Aral Sea Efforts

LD1001185192 Moscow TASS International Service in Russian 1800 GMT 8 Jan 92

[By KAZTAG correspondent Olga Babiy—TASS]

[Text] Alma-Ata, 8 Jan (TASS)— A memorandum on mutual cooperation between the Kazakhstan Government and UNEP—an international organization implementing a UN environmental program, was signed in the republic's capital today. The document envisages coordination of efforts for mobilizing the international public to save the Aral Sea and to restore a normal habitable environment in regions neighboring the former Semipalatinsk nuclear test site. It is also proposed to attract the world community to the solution of other ecological problems and the prevention of further destruction of nature.

Kazakhstan's Tselinograd Oblast 'Ecological Disaster' Area

LD2001092892 Moscow Mayak Radio Network in Russian 1420 GMT 11 Jan 91

[Fayzal Dzhakushev report from Tselinograd; from the "panorama" program]

[Text] An organization called "Ecological International of the Green Cross and Green Crescent" has been set up in Tselinograd. Our correspondent Fayzal Dzhakushev reports:

[Dzhakushev] Ecological disaster areas in this republic are already quite enough for Kazakhstan, despite its great size. Semipalatinsk, Aral, and east Kazakhstan are all areas where the environment and its inhabitants have suffered. But it seems that Tselinograd Oblast will now have to be added to the list. This is the conclusion arrived at today by members of a public organization called "Ecological International of the Green Cross and Green Crescent," established here one year ago.

Uranium ore deposits have been mined in the oblast for several decades. This valuable raw material has been extracted by the open-cast method in order to reduce the cost of mining operations—and this in a region swept by all seven winds.

During the last 12 months, Ecological International has gathered some extremely dramatic information. It established that background radiation on routes taken by uranium shipments was in some instances 50 times the normal

reading. The town of Atbasar has, to all intents and purposes, become the main junction station where these routes meet. Nobody bothered to take this seriously until Yuriy Alekseyevich Rubezhanskiy, chairman of Ecological International, produced a soil sample taken from one section of this station at a recent meeting of the oblast soviet and presented it to the people's deputies.

[Begin recording] [Dzhakushev] What specific options are available to your organization? Maybe you could accomplish something by drawing international attention to the situation?

[Rubezhanskiy] Yes, we have consulted our parent organization in Moscow. They advised us to take the matter to the ecological court. Our organisation has such a court. It should examine this problem first. If that doesn't help, we should appeal to international public organisations—the IAEA in particular.

[Dzhakushev] Hasn't there already been enough reason for the IAEA to intervene in our country? Does the situation in Atbasar and Tselinograd Oblast, as a whole, really justify the intervention of this international organization?

[Rubezhanskiy] You know, I don't think we have yet appreciated the full extent of the calamity. I think that our disaster is even worse than Semipalatinsk's.

Closure of Kazakhstan Bacteriological Test Range Demanded

LD1301135492 Moscow Mayak Radio Network in Russian 1200 GMT 13 Jan 92

[Text] (Mukhtar Shakhnov), chairman of the Aral-Asia-Kazakhstan international committee, dropped a bombshell today in a speech to the seventh session of the Kazakhstan parliament.

Citing foreign sources, he told the deputies about weird and wonderful goings-on within the republic. On the Aral Sea, an island called Vozrozhdeniye [Rebirth]: In Shakhnov's opinion, a more accurate name would be Vyrozhdeniye [Degeneration], because for five decades now bacteriological weapons have been tested there, with terrible consequences.

Only the ill-famed Semipalatinsk range has a worse public reputation than this notorious island. Together, they occupy 18 million hectares of fertile land in Kazakhstan. Not only ground, but also atmospheric tests of nuclear weapons and even neutron bombs have been held at them.

The Aral-Asia-Kazakhstan committee has issued an appeal to heads of state [not further specified] demanding the closure of the terrible range on Vozrozhdeniye island. Thousands of people living near the Aral have signed it.

This was a report from the Aziya-press agency.

FINLAND

Finland Worried About Pollutants From Kola Peninsula

92WN0144E Helsinki *HELSINGIN SANOMAT*
in Finnish 14 Nov 91 p 6

[Unattributed article: "Parliamentary Committee's Gloomy News; No End in Sight for Air Pollution From Kola Peninsula"]

[Text] The parliamentary environmental committee has returned from the Kola Peninsula with conclusive findings: The factories responsible for the pollution will not be closed under any circumstances. Russia needs the nickel for use by its weapons industry as well as for the manufacture of steel and household appliances.

Every one of the committee members who went on the trip feels that the only way Finland can have any impact on this environmental problem that is threatening Lapland forests is to promote Outokumpu's smelter project in Nikel. That would reduce the gaseous sulfur dioxide emissions coming from the Kola Peninsula by half.

The other pollutants come to Lapland as particle emissions. At present not all of their effects are known. The committee determined that the only factory at which Finns can have an influence on emissions is the one at Nikel. Reducing the pollution from Montshegorsk is completely up to the Russians and their methods. The Russians claim to have reduced Montshegorsk emissions by one-fifth.

Seppanen considers cleaning up St. Petersburg pollution more important.

But who will pay for the project and what will it cost?

The committee chairman, Esko Seppanen of the Left Alliance, said that the Russians have no money. He feels that it might be smart for Finns to finance the environmental improvements in the Kola Peninsula. But, then again, he wonders if that is the most important site; "Even though the problems in the Kola Peninsula are truly serious those in St. Petersburg are even more so. Heavy metals are released into the watershed in the St. Petersburg area in such enormous quantities that if we have to prioritize then I think St. Petersburg is ahead of the Kola Peninsula."

Annually Nikel is the source of 300,000 metric tons of mild sulfurous gas emissions. The Outokumpu project would remodel that factory so that these gases would be replaced by a strong sulfur based acid. The yield would be small and it could be used as a raw material by industry.

The nickel content of mosses can be as high as one percent.

Kari Mikkola, research scientist at the Forest Research Lab who is working on the study on Lapland forest damage, also went on the trip with the committee.

Mikkola said that it is clear that the eastern parts of Lapland, especially Sevetijarvi, receive considerable amounts of pollutants from the Kola Peninsula every year. Salla gets less than Inari. Actual destruction of forest has not yet reached as far as Finland.

There is still cause for concern. For example, moss samples from near Montshegorsk have had nickel contents as high as one percent. According to Mikkola's calculations this amount is so great that "it is almost possible to enrich the moss and use it as ore."

FRANCE

Report on Rehabilitation of Natural Areas Presented

92WN0185A Paris *LE MONDE* in French
28 Nov 91 p 12

[Article by Roger Cans: "Proposals To Rehabilitate Natural Areas"]

[Text] The forecasting group for the management of natural areas, which was set up in January 1990 as part of the General Planning Board, submitted its report on Thursday 14 November.¹ Headed by Henry Jouve, former president of the National Center of Young Farmers, the group consisted of agricultural professionals, elected officials, representatives of government departments, experts, and, for the first time ever, protectors of nature. Its report lists a number of proposals which, if adopted by the authorities, will revolutionize territorial management in France.

The planning board's forecasting group first presents a situation report providing interesting data on the 95 percent of the national territory that has not been "artificialized"—that is, neither urbanized nor occupied by major infrastructure (roads, railroads, airports, and so on). It says that the forest, which has expanded by 2 million hectares since 1947, now covers 28 percent of the territory.

That expansion has occurred partly at the expense of agriculture, with tilled land having declined from 32,242,000 hectares in 1969 to 31,790,000 hectares in 1990, or 57 percent of the territory. But the forest has also absorbed uncultivated moors and fallow land, the total area of which declined from 5,296,000 to 3,081,000 hectares during that same period. Contrary to the idea willingly spread by agricultural circles, the area covered by land that is really fallow—moors, scrubland, and marshland—has therefore declined over the past 20 years.

The report emphasizes that the decrease in agricultural area remains a "limited phenomenon" so far, but that it will probably spread as a result of the desertification of certain regions. Its effect can be seen chiefly in the conversion of farmland into forest (either artificial or spontaneous) and the conversion of grassland into plowland (over 1 million hectares during the 1980's), the latter phenomenon being due chiefly to factory farming and the open housing of livestock.

Generally speaking, the group notes that "French natural areas are vast, rich, and varied," but also "not well known, inadequately protected, and currently not uniformly managed." A ranking of the average extent of natural area per capita in Europe (the EEC) shows that central Spain holds the record (three hectares per capita), followed by Limousin and Corsica (two hectares), with only Ireland and Greece in last place (1.5 hectares).

Ecological Logic Versus Economic Logic

"Everywhere, economic logic prevails over ecological logic, and short-term interests take precedence over long-term interests," says the report. To reverse the trend, the forecasting group proposes a number of measures, the most important of which are these: reduce the tax on unimproved land in order to encourage owners who keep natural areas unexploited; revise the overall operating grant to the municipalities so that those that do not cover everything with concrete will not be penalized; introduce environmental logic into land use planning; improve impact studies and democratize government planning surveys; apply the principle of "the polluter pays" to intensive stockraising; extend the inventory of the country's natural heritage to include landscapes and make it known to local elected officials; assign nationwide jurisdiction to the Coastal Conservancy (whose jurisdiction is currently limited to maritime shores and large lakes); and make the departmental tax for sensitive areas compulsory and pay it into a Natural Heritage Intervention Fund empowered to acquire and manage natural areas.

Footnotes

1. *Natural Areas: Capital for the Future*, published by the French Documentation Service (352 pp, 150 francs).

Poll Reveals Good Environmental Intentions, Lack of Action

92WN0235A Paris LE QUOTIDIEN DE PARIS
in French 23 Dec 91 p 4

[Article by Frederic Gershel: "The French: Ecologists at Heart, but Not in Fact"]

[Text] Eighty percent of the French say that they are ready to change their behavior to preserve the environment. But for the time being, good intentions remain just that.

As the year draws to a close, the French are said to be disgusted with politics, excessively pessimistic, and uninterested in anything. Wrong. According to a study done by the French Foundation, 80 percent of us are prepared to join the crusade for a cause we deem noble—protecting the environment—and to change our behavior accordingly.

Specifically, nine out of 10 people questioned are considering using so-called "ecological" products and disposing of their glass bottles in containers designated for that purpose. Eight out of 10 are considering sorting their recyclable garbage themselves, doing without their vehicles for trips under 1 km, and using baskets or net shopping bags instead of plastic sacks.

Furthermore, the study indicates that the French consider the top major environmental risks to be nuclear power (50.4 percent), toxic waste (19.7 percent), and forest fires (13.3 percent). Identified as "great international environmental causes" in the polls are the Amazonian forest (88.1 percent), acid rain (79.5 percent), Antarctica (77.3 percent), and global warming (66.9 percent).

This infatuation with environmental concerns is nothing new, of course, and despite their movement's disorganization, the Greens remain more than ever a fashionable party. But does that mean the French put their laudable intentions into practice? "Things have undoubtedly changed over the past few years," says Christian Brodhag, a Green leader. "Yet despite a new collective awareness of the problem, which has received wide echo in the media, progress has fallen short of our hopes." Throwing greasy papers in trashcans and not on the road, not taking one's pet out to urinate on plants or trees, no matter how big, and having one's car checked regularly is all very good, declares Christian Brodhag. But it is not enough. "The daily struggle to protect the environment must take many forms."

"In water management, for instance, leaky toilets, taking baths instead of showers—all those kinds of things are not very good. On the other hand, people need to acquire habits based on principles, such as refusing absolutely to buy any brand of aerosol. Consumers will learn very quickly that some things are superfluous, and that nothing beats a brush for shaving." "If we want people to radically change their behavior," explains Andree Buchmann, the movement's spokeswoman, "we will have to give them the means to do so. There is an obvious lack of information today, as well as a lack of choice in common consumer products." "For example," says Christian Brodhag, "we have asked the government to introduce a label with point ratings, ranging from one star for products that are somewhat environmentally friendly, to four stars for products that are very much so. We are getting only a simple label, the criteria for which are still murky. Moreover, the price of packaging should be indicated, so that consumers realize that they are often paying for nothing more than a box." So the Greens are boycotting the government's policy, which they claim does not allow people to put their good intentions into practice fully. Yet one sign that environmental concerns are now at the heart of public life is that solutions to each new problem are devised more quickly. Following the dramatic accident caused by the explosion of an aerosol can, a French engineer working in the United States, Yves Privas, invented a gas-free one that poses no threat either to the ozone layer or to people.

The product—a push-button pump driven by an electronic device at a speed of 40 movements a second—provides a continuous spray, just like a classic aerosol can. The pump is not thrown out, and the products are refilled. Expensive at the outset (250 French francs for the pump), its inventor says it is economical in the long run.

High Radioactivity Levels Detected in Bouchet Nuclear Waste Site

92WN0235B Paris LIBERATION in French 27 Dec 91
p 20

[Article by Guy Benhamou: "Bouchet Turns Up Residues Packed With Radioactivity"]

[Text] The Atomic Energy Commission (CEA) has detected a very high level of radioactivity in its former Bouchet waste site in Essonne. The measurements, which were imposed on the CEA, prove the environmentalists right. They also raise

the problem of the site's safety, since total evacuation of the residues is out of the question.

Abnormally high levels of radioactivity and remnants of metal drums have just been discovered at the Bouchet nuclear waste site, at Itteville in the Essonne region. Initial measurements that were taken during excavations last Friday and Monday showed peaks of nearly 100 millirems an hour (mrem/h) deep underground.¹ This is a very high figure, privately admits an official of the Atomic Energy Commission, the organization that manages the site and that ordered the dig. The contents of highly eroded remnants of metal drums have not yet been determined with certainty. But they may be the residue of uranium mineral ore that was very rich in radium, a highly toxic radioactive element.

This new find is just one more episode in the Bouchet waste ground affair. The site is located 50 km to the south of Paris. For almost two years now, local environmental associations have been fighting against the waste (see *LIBERATION* 6 Sep 1990) and the attempts of the CEA to rid itself of the burdensome empty lot. Bouchet is entirely ordinary in appearance, with its piles of builders' debris and mounds of overgrown dirt. Behind the rusty chain-link fence, however, 30,000 metric tons of radioactive waste have been sleeping for over 20 years.

Indeed, between 1956 and 1971 the one-hectare plot served as a storage ground for the solid residue and mud that were produced during treatment of the uranium ore. The mining waste came from the CEA's Bouchet factory, which was shut down and then dismantled after 1971. The factory was closed so long ago that everyone seemed to have forgotten about the residues. Then, last year, the CEA submitted a plan to rehabilitate the site to the municipality of Itteville. It included a lawn-covered green space and a scheme to enlarge the neighboring highway intersection.

But the CEA's good intentions stumbled over the curiosity and stubbornness of the local environmental associations, which recorded abnormal atmospheric radioactivity around the site. After heated controversies regarding the figures and the real or imagined dangers of radon, which is the radioactive gas emitted by some of the waste buried at Bouchet, the then prime minister Michel Rocard intervened to suspend all work at the site. Finally, a prefectural decision dated 27 May 1991 required the CEA to perform a series of ambient radioactive measurements, so that a decision might be reached on the conditions under which the site could be improved.

Those measurements confirmed the existence of areas with very strong radon emissions. "The study also showed that the radioactive deposits actually extended beyond the enclosure," stresses Philippe Vesseron, director of the CEA's Nuclear Protection and Safety Institute (IPSN). One of those areas, on the southern edge of the site, was treated to an in-depth excavation—a trench 20 meters long and two meters deep—over the last few days.

Monique Sene, who is the president of Scientists Group for Information on Nuclear Energy (GSIEN), witnessed the dig. The discovery of metal drums was only mildly surprising.

"We know from the archives that nearly 500 metric tons of uranothorianite from Madagascar were treated in Bouchet," she explains. "It was very rich ore, which produced highly radium-charged residues. They were put in drums and sent to La Hague." Moreover, the physicist contends that the drums that were evacuated to the Manche storage center pose serious problems. So serious that there are currently plans to relocate them to another, yet to be determined, site. "On the other hand, the documents clearly show that chemical treatment did not work well on several occasions at Bouchet. When that happened, the products were simply enclosed in drums and then buried on site."

It is, in fact, impossible to know with any accuracy what was stored at the grounds. The former sedimentation pit, into which the factory's residual liquids were channeled, has been filled in to a depth of six meters. Robert Lallemand, a CEA general inspector, says that "the ground still contains about 30 grams of radium." Other estimates put this very dangerous radioactive element in the range of 10 to 80 grams, particularly as the whole surrounding area is extremely swampy and a part of the radium may have been carried away by the water. The CEA has recently—under prefectural injunction—placed a string of detectors in the underground water table that have so far not recorded any anomalies. "But for years," Monique Seles reminds us, "the waters were not monitored much." To put an end to the Bouchet site affair once and for all, the CEA has just decided to buy it. "This will enable the state to guarantee that it will be monitored over a very long period of time," explains Robert Lallemand, who talks about "several hundreds of years." To reduce radon emanations, the CEA is also proposing that the whole site be covered with a layer of clay and gravel, and that the immediate surrounding area be strictly monitored. This solution has the merit of being feasible, as Robert Lallemand admits. "If the prefect, for some reason that I cannot imagine, were to ask for the total evacuation of Bouchet's radioactive residues, we would not even know where to put them." Not to mention the substantial risks to the workers extracting the 35,000 contaminated cubic meters and possible new underground surprises. The next Essonne departmental health committee, which is expected to meet during January, will examine the fate of the waste ground. In the meantime, the results of the analyses of the soil samples taken during the excavations should be made known. A total of 30 samples were taken and sent to three different laboratories.

Footnotes

1. French law currently sets the maximum acceptable dose for humans at 500 millirems a year, which corresponds to a rate of 0.057 mrem/h.

Controversy Continues Over German Refuse Dumped in Lorraine

92WN0216A Paris *LE MONDE* in French
31 Dec 91 p 7

[Article by Danielle Rouard: "Lorraine Flooded With German Waste; Border Departments Get Thousands of Tons of Refuse From Other Side of Rhine; Moselle Decides To Oppose It"]

[Text] Metz—The village is still asleep when the truck that has come in from Saxony appears at the municipal dump in Aboncourt (Moselle), where the dump trucks and bulldozers have begun operating long before dawn. The young Moselle driver, who had picked up his load the day before 500 km from there, whispered a few words to the bulldozer driver responsible for spreading the contents of the trucks over the open-air site. Then he tilted the truck body, from which tons of household garbage collected in Germany tumbled down. A foul-smelling vapor was given off by the fermenting pile.

The young customs official who had come to check on the conformity of the load with regulations moved away from it discreetly, feeling nauseous. Her superior turned over a pile of trash with his boot under the sneering eye of the bulldozer driver who lashed out: "Well, do you find these barrels toxic?" The customs official lingered over a bit of gray plastic after checking the customs clearance documents. Everything seemed to be in order. At any rate, what means do they have for detecting fraud? How can they tell the difference between hospital waste and household trash?

So he gave the driver the green light. The bulldozer crushed the load in a few seconds, then went over it back and forth to level and compact it. Not a single identifiable trace of the load that had come in from Saxony remained. Next! Five trucks were waiting their turn. During the end of that night six of them went through in one hour, five of them from Bavaria, Baden-Wuerttemberg, and Saarland.

Where Everyone Profits

The German company that collected the garbage had done its arithmetic: Its cost per ton dumped in France is a third of the current price in Germany. Consequently, the shipping cost is of little importance, even for a distance of 500 km. This is also good business for those concerned in Lorraine. The contractor authorized to operate the dump, a subsidiary of the General Water Company, gets 300 French francs [Fr] per ton and the municipality of Aboncourt Fr60.

The mayor turned up unexpectedly, informed by word of mouth of the customs officials' surprise visit: "What's up now?" To what did he owe this morning visit by the customs "flying squad"? The matter seemed to have been settled: The importing of household refuse for dumping at Aboncourt must come to an end¹ by 1 January 1992.

The mayor did not turn pale: "Aboncourt is going to lose its sole source of income. And there's no intercommunal solidarity." The neighboring urban districts collect various taxes, but they do not pass on any of the proceeds to the rural market towns that have their head offices in the same association. Those are the rules. Thus, the 340 residents of Aboncourt will have to make up the future budget deficit by themselves. "I'm prepared to resign, since my income is being cut off," the mayor asserted. The customs officials were not happy about it either: "It's not our job to sift through garbage. Let the government purely and simply ban these imports. Lorraine isn't Germany's garbage can." In 1990, 600,000 tons were imported!

A few small, inoffensive bags were lined up on the desk of Mr. Michel Laurent, the chief customs collector. They are of

transparent plastic, sealed, for brown-colored chips. What could it be? "A six-letter word," this official replied laconically. Actually, the product had just been seized during an inspection at this customs point that is crossed by 400 trucks a week loaded with a total of 9,000 tons of refuse. According to the declaration form presented when clearing customs, it was fertilizer. But in fact it was sludge produced during purification, then dried and processed by a German processor. Now, purification sludge is subject to stricter regulations than household refuse or fertilizers, which are allowed to circulate freely within the Common Market.

Customs immediately ordered the return of the shipment and instituted proceedings against the shipper. Three or four of the 80 trucks that transit the Saarbruecken Freeway every day transport this processed sludge in Germany. All of them have to present certificates of origin that certify that their loads have been processed. French customs may take a sample, which will be analyzed in a laboratory. If the product is in conformity with regulations, it may be used to spread on the fields.

Today refuse carriers put their goods in closed containers. Even though it is first of all a matter of conserving the environment, this permits people to engage in all sorts of fraud. "How can we tell whether the goods that are declared are the ones that were actually loaded?" the collector noted. "We can't have them open every vehicle."

Another lucrative bonanza: tires. European drivers yearly abandon millions of them, which cannot be eliminated for lack of ad hoc installations. Convinced that he had a market there, one day Saarlander Dennis Helmcke proposed to the municipality of Forbach (Moselle) that a plant for the processing of used tires be established. The town has been severely short of jobs and funds since mine production was reduced to a minimum. The young businessman set up a company under French law, Tyres Recycling Industries (TRI) and established its main office in Forbach. Then he rented a 20-hectare lot next to a chemical plant and began to warehouse the raw material.

Tires Stuffed With Resin

A year and a half later: Goodbye gold mine and captain of industry. After opening three storage areas at Sarreguemines, Betting-les-Saint-Avold, and Forbach, the Saarlander is nowhere to be found. The police are on his heels for the illegal importing of hazardous waste. In early November a fire broke out at the Forbach warehouse, set off by 140 barrels of outdated paint from the former GDR that were under the tires. The nearby chemical plant very nearly exploded "and half of Forbach would have gone up with it!" young Capt. Jean-Luc Senn, who is also a customs official, said with indignation. That blew the lid off the affair. Some of the tires were literally stuffed with resin.

A hideous wall of tires and hulks of German cars bathed in old crankcase oil still stands today just a few steps from the miners' quarters. When there is a strong wind, the cyanide oxide from the warehouse could react with the products of the neighboring plant. The whole town of Forbach is up in arms. But how can they get rid of the "thing"? Under pressure from local defense committees, Moselle has closed

down all these dumps that handle imported refuse with the exception of the one at Montois-la-Montagne. Customs officials made a systematic search for illegal dumps by flying over the department of Moselle. They listed a dozen of them! In all of Lorraine only 24 dumps are officially authorized, three of them for industry and 13 incineration plants.

In spite of all this, the defenders of the environment are not laying down their arms. "Pollution must be avoided at the source by making clean industries mandatory," Mr. Daniel Beguin, the regional Greens candidate, repeated. All of them are opposed to three processing projects currently being studied in Hauconcourt, Thionville, and Forbach. Five communes have organized consultations in the form of a referendum: with a participation of 53 percent—95 percent "against" [the projects]. The next election date has calmed some local officials' eagerness to receive the "German manna," even if it means giving up a source of revenue equivalent to the housing tax.

Footnotes

1. This was a unilateral decision by the importer since the prefect had issued two decrees suspending authorization of the processing of waste imported by the dumps at Teting-sur-Nied and Tritteling.

GERMANY

Defense Ministry Details 'Dangerous Materials' Left by Former NVA

LD0101175792 Berlin ADN in German 1653 GMT
1 Jan 91

[Text] Neubrandenburg (ADN)—The Bundeswehr has taken over "environmental problems of a hitherto unprecedented nature" from the former National People's Army [NVA]. This emerges from a confidential Defense Ministry report quoted by the Neubrandenburg-published NORD-KURIER on Thursday.

It states that apart from weapons and equipment, at least 150,000 tons of ammunition, around 4,500 tons of highly toxic missile propellant, and 6,000 tons of "dangerous materials, some of it of an "unknown composition" have to be disposed of in an environmentally safe way. The report states that the NVA also left 920 so-called suspected areas of varying degrees of risk. The Federal Defense Ministry estimates that the disposal, using new processes in some cases, will take up to 10 years.

The paper says that a particular source of concern is the "highly radioactive sources of radiation" taken over from the NVA, currently stored at a site in Storkow (Beeskow rural district).

CDU Calls for New Nuclear Reactors for Ecological Reasons

AU2001143792 Hamburg BILD AM SONNTAG
in German 19 Jan 92 p 2

[Report by "bs": "CDU Calls For New Nuclear Power Plants"]

[Text] According to CDU [Christian Democratic Union] politician Wolfgang von Geldern, new nuclear power plants must be built in Germany. "If we continue to burn so many fossil raw materials such as oil and coal to win energy, we will destroy our planet. The carbon dioxide burden will lead to a climatic catastrophe. That is why we must expand our nuclear energy system in Germany, too," said Von Geldern, who is chairman of the Bundestag Committee on Environmental Protection and Reactor Safety, in a BILD AM SONNTAG interview.

The CDU politician believes that in the next 20 years, "up to five new nuclear power plants must be built in all of Germany. That will allow us to increase the percentage of nuclear energy in electricity production by about 20 percent (currently 32 percent). That is the only way for us to achieve our goal of decreasing the carbon dioxide burden by one-fourth until 2005."

Von Geldern is aware of the danger involved in nuclear energy: "However, there is no safe energy. Let us not fool ourselves, as the Austrians are doing. They are opposed to nuclear power plants but buy nuclear power from Chernobyl in the Ukraine."

IRELAND

Environmental Battle Looms Over Plans for Toxic Waste Incinerator

92WN0242A Dublin IRISH INDEPENDENT
in English 18 Dec 91 p 12

[Article by Eilish O'Regan and George Jackson]

[Text] A major environmental battle is looming for the government following yesterday's announcement by Environment Minister Rory O'Hanlon that plans to site a toxic waste incinerator in the Republic will have to be revived.

The controversial proposal is back on the table following yesterday's decision by the chemical company Dupont to drop widely opposed plans to build an all-Ireland incinerator at Maydown on the outskirts of Derry.

A company spokesman said "In the current competitive investment climate the company has decided that the projected return was not sufficient to merit funding" but denied speculation that the Irish government had refused to contribute £12.5m to the project.

Mr. O'Hanlon immediately revealed he has ordered a review of the need for a waste disposal unit here in light of the Dupont decision. Previous proposals for a disposal facility put forward a number of consortiums will have to be looked at again.

The urgency to provide an incinerator has now become more acute as new EC regulations which are likely to be approved next month require that hazardous wastes be disposed of at the nearest suitable incinerator and not shipped abroad. Previous estimates put the cost of the incinerator at around £8m and negotiations were underway last year with two consortiums.

An estimated 52,000 tonnes of toxic waste are currently produced in Ireland and, while manufacturing industry disposes of 34,000 tonnes, another 15,000 are exported to other countries including Britain and Finland.

The Minister said yesterday that in 1990 the government had committed itself to a sophisticated and safe method of disposing of toxic waste in this country but this was put on hold after the Dupont project was proposed.

He said his predecessor, Pdraig Flynn, who visited the Derry plant, had adopted a wait-and-see approach to developments.

Pointing to the EC Draft Directive he said the new rules will be tighter controls and countries will have the right to refuse to accept toxic waste for disposal if they wish.

Accepting the siting of an incinerator in the Republic is a thorny question he conceded. A balance would have to be found between the need for disposal, people's views and the environment. The siting of the incinerator is a decision for the consortium—subject to the normal planning process.

Greenpeace called on the government to detail plans for a comprehensive toxic waste reduction and elimination strategy.

Chernobyl, Radon Gas Responsible for Largest Radiation Doses to Irish Public

*92WN0237A Dublin IRISH INDEPENDENT
in English 5 Dec 91 p 15*

[Article by Don Lavery]

[Text] High radiation levels from Chernobyl of nearly six times the EC limit have been found in mountain sheep here...but naturally-occurring radon gas is the largest contributor to radiation doses received by the Irish public, the Nuclear Energy Board revealed yesterday.

Radiation from the world's worst nuclear accident at the Soviet plant in 1986 is still being detected in sheep, lakes and soil here—and levels in sheep were higher in 1990 than 1989. However, radiation from Sellafield found in fish and seawater continues to decrease.

Meanwhile surveys on radon gas carried out in 422 schools in Mayo, Galway and Clare found 16 of them exceeded screening levels set by radiation experts.

The board's 1990 report, published yesterday, said mountain sheep grazing in the most highly contaminated upland areas in the Republic were monitored on 23 farms: 11 in Donegal, four in Waterford, two each in Cavan, Leitrim and Sligo and one each in Louth and Kerry.

In all about 2,300 sheep were monitored, of which 52 pc had radioactivity in excess of the EC limit of 600 bq/kg. But the highest activity recorded was 3,500 bq/kg—greater than the highest recorded the previous year, and nearly six times the Community limit.

However the report says lowland finishing of sheep ensured levels were considerably reduced prior to slaughter and extensive monitoring at a abattoirs and sampling at

butchers' shops confirmed radiation doses attributable to consumption of sheepmeat were of "negligible radiological significance."

Only four sheep had been withdrawn by veterinary inspectors from slaughter. The results showed regular consumption of sheepmeat "does not constitute a significant health hazard."

The report blames radon gas as biggest contributor to radiation doses received by the public here. Measurements were carried out in 334 houses but the majority—303—had less than half the Government limit of radon concentration. Only six were well above the limit.

In a follow-on survey in Galway, Mayo and Clare 20 out of 57 houses had concentrations above that limit and the board recommended householders consider remedial action to reduce the concentration in their homes. Also, employers should measure radon in workplaces in anticipation of future EC legislation.

Board chief executive Tom O'Flaherty said high levels of radiation remained in live sheep. Radiation from Chernobyl would be measureable for decades yet.

PORTUGAL

Nation Gets 'Unfavorable' Environmental Rating From EEC

*92WN0198A Lisbon EXPRESSO in Portuguese
30 Nov 91 p A18*

[Article by Mario de Carvalho: "EEC Gives Portugal 'Unfavorable Grade' in Analysis of Environment"]

[Text] Portugal did not receive a "favorable grade" in the analysis of how Community directives regarding the environment are being implemented, according to a report submitted in Brussels by Eurodeputy Jacques Vernier.

In the various sectors of the environment—water, air, dangerous substances and industrial risks, waste, noise, and the protection and conservation of nature—Portugal is among the EEC countries exhibiting the most shortcomings when it comes to adopting and complying with those directives. In that respect, Spain and Greece are in the same category as our country. In Jacques Vernier's survey concerning the implementation of Community environmental legislation, the Eurodeputy says that the existence of environment ministries in some states is "insufficient," citing Portugal, Greece, and Belgium as examples.

In the author's opinion, Community environmental law can emerge only through the existence of a strong "ecological awareness" in which environmental associations play an important role, a situation that, according to the document, is most evident in the countries of Northern Europe.

Portugal and Spain are the countries experiencing the most "difficulties in adopting" Community directives, with water, waste, and the protection of nature being the areas causing the most complaints to the Community.

Water: Portugal Top Offender

As regards water, our country takes first place when it comes to failure to implement Community directives. In most cases, it is failing to provide the commission in Brussels with reports on how the situation is progressing.

Concerning the discharge of effluents, Portugal was a year late in announcing its program for reducing the pollution caused by a number of substances, as were Germany, the Netherlands, France, Spain, Belgium, Luxembourg, and Italy.

Within Portugal, there are still no implementing regulations to govern the activity of the National Water Institute, which was established in March 1990.

Concerning water for swimming, Portugal is not yet under obligation to adopt the directive, but it has submitted its draft law in an attempt to implement the regulations before 1993. The significant amount of work to be done in that area is being carried out by the General Directorate of Environmental Quality (DGQA).

However, the necessary resources (technical and human) for overseeing water quality control in Portugal are inadequate.

Air: Inadequate Distribution of Unleaded Gasoline

In the case of air, as well, the situation is one of "pollution," with the most serious problems being found in Greece. On this subject, most of the EEC countries have chosen to implement legislation based on French law, especially as regards the requirements placed on industrial facilities.

Portugal has a system for monitoring air pollution at both the national and the local level as well as an autonomous system making it possible to take measurements at the major sources of pollution: the chemical industry, thermal power plants, cellulose plants, and cement plants.

Despite the existence of equipment, the operation of the Air Management Committees still poses difficulties in some regions of the country.

The distribution of unleaded gasoline and atmospheric pollution due to automobile traffic are also analyzed in the report by Jacques Vernier, who is a member of the European Parliament's Committee for the Environment, Public Health, and Consumer Defense.

Portugal, Spain, Greece, and Belgium are the countries with the most pronounced shortcomings in their national networks for the distribution and sale to the public of unleaded fuel.

Dangerous Substances on the Market

As regards dangerous substances and industrial risks, an area in which there are clear directives on the use of asbestos and other dangerous products and the genetic manipulation of microorganisms, Portugal is far from achieving full implementation of those directives.

Concerning serious industrial risks, our country is supposed to inform the EEC of the situation in its territory and publicize the greatest risks, according to Community directives.

The implementation of emergency plans inside and outside manufacturing plants presenting a high level of risk is another Community requirement and one that also emphasizes the need to have inspectors monitor the safety systems.

The DGQA is the agency responsible for monitoring safety systems in manufacturing plants, but its small technical staff and limited funds prevent it from operating more effectively.

Waste: Portugal Violates Standards

As regards waste, most of the states do not submit their reports to the EEC, and Italy and Belgium have been the targets of legal action before the Court of Justice.

Of the 190 complaints received by the Community in 1988, 37 were concerned with waste, and 12 of the more than 190 complaints received through June 1990 also had to do with waste.

The states are having difficulty incorporating the directives concerning waste into their legislation, according to the Eurodeputy's document, which points out that Portugal has not yet submitted its program for treating and eliminating dangerous waste. For that matter, only the Netherlands, Spain, and the United Kingdom have submitted such programs, and then only in summary form.

In this field, our country is "joined" by Greece, Ireland, and Italy, and Brussels does not know what is being done to solve that serious problem.

On several occasions, Community officials and ecological organizations such as Greenpeace have drawn Minister Carlos Borrego's attention to this matter and to the problem of shipping dangerous waste across national borders.

A project is currently under way to find sites for dirt fills and the construction of a plant for treating dangerous waste. That project is to be completed in 1993 and is being supported financially by the EEC.

Utilization of Recycled Products

Concerning the utilization of solid urban waste, the Ministry of Environment and Natural Resources has signed protocols with various businessmen's associations, but we are still a long way from establishing an integrated market for recycling products that are duly classified for use.

In France, a national agency has been established to recover and recycle refuse, while, in the United Kingdom, it is the local authorities who take responsibility for recycling.

Community standards regarding noise pollution are also not being implemented in Portugal, and the same is true in Spain.

Nature Penalized

The conservation and protection of nature are the issues involved in the largest number of complaints and legal actions brought before the Community, and, here again, Portugal is one of the chief offenders, although it is only one of a vast range of countries: Italy, the United Kingdom, France, Belgium, Germany, Spain, Greece, and the Netherlands.

With regard to hunting, the EEC has information to the effect that closed seasons are not being observed in some regions of Portugal, while only Denmark comes up with a satisfactory answer on the question of areas classified as "special protection areas."

The protection of habitats is another area where Spain, Greece, Italy, and Portugal are the most penalized, several complaints against us having been filed with the Community.

Concerning the trade in endangered species (CITES), legal actions are currently pending against Portugal, Spain, Ireland, France (five), Germany, the United Kingdom, Denmark, Belgium, and the Netherlands.

The document also complains of the lack of funds available to D-G XI (the EEC's environmental agency) for enforcing Community standards, saying that there are only 10 officials to monitor legal procedures and violations in the environmental area.

The Eurodeputy prepared the report based on information available to Community organizations and supplied by the respective member states. He emphasized that that information was "only the visible part of the iceberg."

Study Details Needed Investment for 'Effective' National Environmental Strategy

*92WN0198B Lisbon EXPRESSO in Portuguese
14 Dec 91 p A24*

[Article by Mario de Carvalho: "Portugal Must Invest 800 Million in Environment"]

[Text] To join the "first division" of EC countries carrying out an effective policy for the conservation and protection of the environment, Portugal would have to invest about 800 million contos between now and 1998.

That investment would consist of 450 million contos to be spent between 1991 and 1995 and 350 million contos to be spent between 1995 and 1998, with particular importance being assigned to investments in connection with water, air, and the conservation of nature.

That scenario appears in a study on "National Strategy for Environmental Policy" that was prepared by the Department of Environmental Science and Engineering of the School of Science and Technology at the New University of Lisbon at the request of the office of the minister of environment and natural resources.

The teamwork coordinated by Prof. Fernando Santana resulted in the identification and quantification of problems in the various areas of the environment: water, waste, air, and the conservation of nature. The study is divided into three scenarios: the first reflects a continuation of the status quo, the second sets forth goals to be achieved by 1995, and the third, considered "more realistic," sets the target date at 1998, which is when the Community directive on the Treatment of Household Wastewater will take effect.

Acknowledgment of Delay

The study acknowledges Portugal's delay in implementing measures for the protection and conservation of the environment. It begins with a comparison between our country and the EC as far as progress in the treatment of water is concerned. In that area, Portugal shows shortcomings in the drainage and treatment of urban wastewater, it being estimated that only 12 percent of Portugal's industrial effluent is treated. As far as water supplies are concerned, that right is being satisfied for only 64 percent of the population.

As regards waste, the current levels with respect to collection and treatment stand at 64 percent and 36 percent respectively. The situation with air quality is also below standard, it being estimated that implementation of the Community directive on maximum emissions from small combustion facilities, now in preparation, will represent a reduction of the amount of SO₂ (sulfur dioxide) in the pollution burden by 14 percent. It will also be necessary to enforce the standards for controlling the emission of nitrogen oxide by automobiles through the compulsory installation of catalytic converters beginning in 1993.

The financial instruments for carrying out the proposals described in the study are also discussed. They involve investments in the environment by the public sector (central and local governments), the use of EC funds, and the enforcement of legislation concerning water and air.

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